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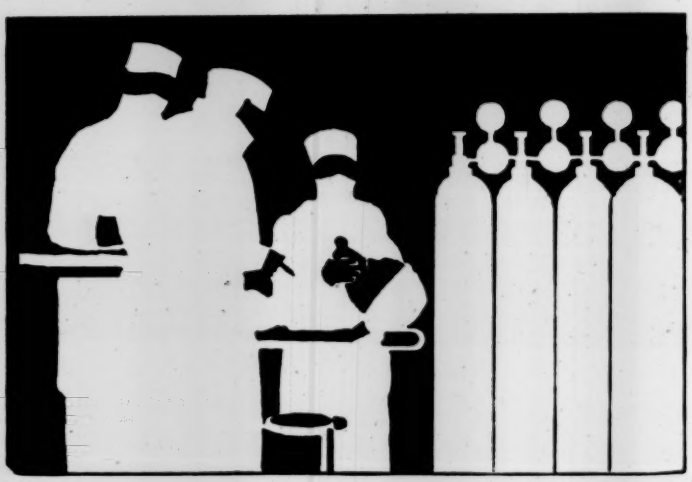
NATIONAL ASSOCIATION



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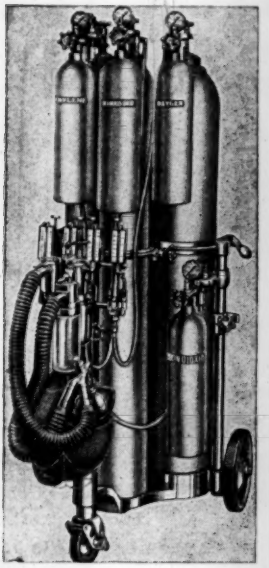

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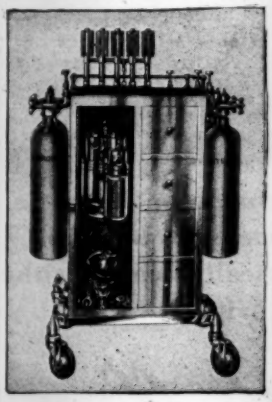

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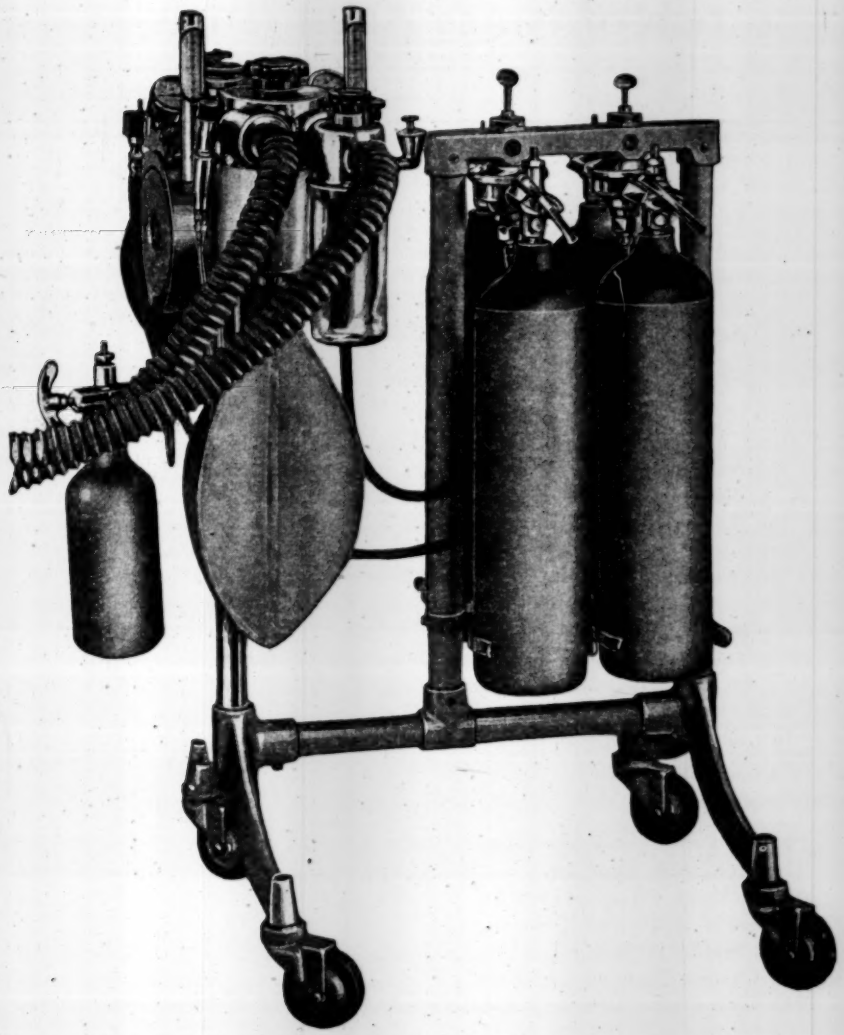

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Literature on Request

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The Bulletin of the National Association of Nurse Anesthetists

VOLUME 6, NO. 3 AUGUST 1938

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Entered as second class matter February 6th, 1937, at the Postoffice at Cleveland, Ohio, under the Act of March 3rd, 1879.

FULL-TIME EXECUTIVE SECRETARY APPOINTED

Miss Anna Willenborg, who has been acting as Executive Secretary of the National Association of Nurse anesthetists at National headquarters, 18 East Division Street, Chicago, Ill., since the last annual meeting, giving the Association all the time possible while still fulfilling her duties as Chief Anesthetist at St. Joseph's Hospital, Chicago, was appointed by the Board of Trustees full-time Executive Secretary, effective July 1, 1938. The organization is very fortunate in being able to secure the services of Miss Willenborg and the Board of Trustees bespeaks for her the continued cooperation and support of the officers and members.

THE HEADQUARTERS OF THE

NATIONAL ASSOCIATION OF NURSE ANESTHETISTS

18 EAST DIVISION STREET,

CHICAGO, ILLINOIS

SIXTH ANNUAL MEETING

NATIONAL ASSOCIATION OF NURSE ANESTHETISTS

September 26-30, 1938

Dallas, Texas

Held in conjunction with the American Hospital Association

All members of the National Association of Nurse Anesthetists and their friends are invited to join us in Dallas the week of September 26th for the sixth annual convention of the National Association of Nurse Anesthetists.

Dallas is waiting to welcome you with a promise of full and interesting convention days. The Program and Local Committees have been untiring in their efforts to make this convention an inspiring, educational and socially pleasant period.

A convention serves a number of purposes, including a closer coordination of organization activities necessary to development and growth. Such gatherings also make possible the opportunity for friendly personal contacts, bringing together a large number of people whose problems and interests are similar.

Bring with you to the convention this fall your own professional problems and your state organization problems, constructive criticism of your organization at this stage of its growth, and ideas for its further development, and last but not least, a holiday spirit.

MIRIAM G. SHUPP, President
National Association of Nurse Anesthetists

Convention headquarters—Hilton Hotel. The Hilton Hotel is situated in the center of the city in the hotel district. The general sessions will be held in Daugherty Hall, Fairpark Auditorium, which is about two miles from the Hilton Hotel.

Official registration — Daugherty Hall, Tuesday morning, September 27. Registration fee—One ($1.00) Dollar. There will also be a registration and information desk at the Hilton Hotel, mezzanine floor, which will be open Monday, September 26 from 2:00 to 6:00 P.M.

PROGRAM

Sunday, September 25 — Meeting of the Board of Trustees
Hilton Hotel

Monday, September 26

9:00 A.M.—12:00 P.M. Meeting of the Board of Trustees

1:30 P.M. Separate Joint Meetings of the Board of Trustees with the following Committees:
- Public Relations
- Publishing
- Educational
- Membership
- Revisions

Tuesday morning, September 27

GENERAL SESSION

FAIRPARK AUDITORIUM, DAUGHERTY HALL

Presiding—Verna M. Rice, Mobile, Ala.

9:30 A.M. Invocation
The Reverend Floyd Poe, Presbyterian Church, Dallas

9:45 A.M. Address of Welcome
The Honorable George A. Sprague, Mayor of Dallas

10:00 A.M. Greetings from the American Hospital Association
Robert E. Neff, President, Iowa City, Iowa

BUSINESS MEETING

Presiding—Miriam G. Shupp, President

10:15 A.M. Report—President
10:30 A.M. —Executive Secretary
—Treasurer
—Report of Standing Committees
—Appointment of Tellers
—New Business

Tuesday afternoon, September 27

GENERAL SESSION

CONVENTION HALL

Presiding—Jennie Houser
Memphis General Hospital, Memphis, Tenn.

2:00 P.M. "Sodium Amytal and Ether in Thyroidectomies"
L. E. Williford, M.D., Houston, Texas

2:15 P.M. "My Experience in the Administration of 10,000 Anesthetics"
Sister Mary Clementine
St. Mary's Hospital, Galveston, Texas

2:30 P.M. "Helium—Its Value in Therapeutics and Anesthesia"
Dorothy Lee, Houston Clinic, Houston, Texas

2:45 P.M. "Watching the Condition of the Spinal Anesthesia Patient During Operation"
Howard DuPuy, M.D., Baylor University Hospital, Dallas, Texas

3:00 P.M. "Oxygen Therapy" (illustrated)
W. H. Potts, M.D., Medical Arts Bldg., Dallas, Texas

7:00 P.M. Banquet—The Dallas Athletic Club

Invocation

Introduction of Guests

Guest Speaker
Mr. Laurence Melton—Melton Printing Company, Dallas

Music

Wednesday morning, September 28

8:30 A.M. "Sodium Pentothal in Major Surgery"
Anne Beddow, Norwood Hospital, Birmingham, Ala.

GENERAL SESSION
CONVENTION HALL
Presiding—Hazel J. Peterson
Fairview Hospital, Minneapolis, Minn.

10:00 A.M. Round Table—"Organization"
Virginia C. Godbey, Norfolk General Hospital, Norfolk, Virginia
Discussion—Gertrude L. Fife, University Hospitals, Cleveland, Ohio

11:00 A.M. "Novocaine Poisoning in an Infant Successfully Treated with Intravenous Injection of Evipal Soluble"
Alice M. Hunt, Ass't Professor of Anesthesia
Yale University School of Medicine, New Haven, Conn.

11:15 A.M. "Nitrous Oxide Anesthesia"
Louise G. Halford, Meharry College Hospital, Nashville, Tenn.

11:30 A.M. "Cyclopropane"
Osa M. Beck, San Angelo Medical & Surgical Clinic, San Angelo, Texas

12:00 P.M. Luncheon—Hotel Hilton
University Hospitals of Cleveland (Lakeside) School of Anesthesia Alumnae Association

Guest Speaker
Hilda R. Salomon, Jewish Hospital, Philadelphia

"What My Training at Lakeside Has Meant to Me"
Mary Vine Allison, Meriden Hospital, Meriden, Conn.

Wednesday afternoon, September 28

GENERAL SESSION

Presiding—Alice Barth

Youngstown Hospital, Youngstown, Ohio

2:00 P.M. "Thoracic Surgery"
C. B. Carter, M.D., St. Paul's Hospital, Dallas, Texas

2:15 P.M. "Anesthesia in Carcinoma of the Lung"
John V. Goode, M.D., Dallas, Texas

2:30 P.M. "Anesthesia in Thoracic Surgery"
Olive Berger, Johns Hopkins Hospital, Baltimore, Md.

Discussion—Kathleen Sturgeon
University Hospital, Ann Arbor, Mich.

3:00 P.M. "Analgesia in Obstetrics"
G. Herbert Beavers, M.D.
Methodist Hospital, Fort Worth, Texas

3:15 P.M. "Anesthesia in Obstetrics"
Ione Wessinger, Henry Ford Hospital, Detroit, Mich.

3:30 P.M. "Anesthesia in Orthopedics"
C. F. Clayton, M.D., and
Grace Richardson
St. Joseph's Hospital, Fort Worth, Texas

3:45 P.M. "Postoperative Pulmonary Conditions"
Azro T. Woods, M.D.
Dallas Medical & Surgical Clinic, Dallas, Texas

7:00 P.M. Banquet—American Hospital Association
Baker Hotel

Thursday morning, September 29

GENERAL SESSION

Presiding—Rose G. Donovan

Mt. Sinai Hospital, Philadelphia

10:00 A.M. Panel Discussion
"Relation of the Anesthetist to the Hospital and the Surgeon"
Chas. W. Flynn, M.D., Medical Arts Bldg., Dallas
Bryce L. Twitty, Superintendent, Baylor University Hospital, Dallas

Discussion—"Training of the Nurse Anesthetist"
Hattie Vickers
Vanderbilt University Hospital, Nashville, Tenn.
Frances Hess
Long Island College Hospital, Brooklyn, N. Y.

11:30 A.M. Sightseeing Trip—
Luncheon—Chapultepec Restaurant

Thursday afternoon, September 29

Presiding—Miriam G. Shupp, President

2:00 P.M. Report of State Activities
Informal Round Table
Unfinished Business
Report of Tellers
Introduction of New Officers

Friday morning, September 30

9:00 A.M. Clinic—Baylor University Hospital
James T. Mills, M.D., Medical Arts Bldg.

OBSTETRICAL SOCIETY

A. J. SKEEL, M.D., F.A.C.S.*
St. Luke's Hospital, Cleveland, Ohio
President, Ohio Obstetrical Association

As a brief introduction to this report perhaps it would be well to state briefly the conditions and circumstances under which the Cleveland Hospital Obstetric Society of Ohio came into being.

For at least ten years Dr. De Lee had been writing articles directed chiefly against obstetrics as practiced in general hospitals. He had a host of followers in our profession. The tone of these articles is well represented by one which appeared later in the Journal of the American Medical Association. I quote a few lines: "There is no question that delivery in a general hospital carries a much higher danger of contagion than in the home. One almost wonders whether hospitalization of normal labor cases should not be abandoned, leaving normal deliveries to private physicians or even midwives, and reserving the hospital with its better equipment for complicated cases only."

In the Ladies' Home Journal appeared de Kruif's article entitled "Saver of Mothers", headed by the caption "Eighty-five years ago a Hungarian doctor proved that most deaths of mothers in childbirth are no less than murder.... Yet today in America, one out of eighteen mothers is killed every year....needlessly." We asked at that time, "How soon will they all be dead?" de Kruif actually said, "Of all the married women dying between the ages of fifteen and forty-four, one out of eighteen dies of childbed fever." The editorial caption misstated facts, not two-fold, not three-fold but many hundred-fold.

Aroused by such articles in both medical and lay journals, a meeting of the chiefs of the Cleveland obstetric departments was called on March 12, 1932, and a formal organization was agreed upon. This group decided, "If we are as bad as we are declared to be, we need to clean house. If the charges against hospital obstetrics are untrue we need what at present is lacking, viz., statistical data with which to defend ourselves."

---

* Read at the annual meeting of the Ohio Nurse Anesthetists' Association, held in Columbus, Ohio, April 6 and 7, 1938.

In 1933, the now famous New York report of the Commonwealth Fund was published. I quote short excerpts from their report. On page 143 this statement is made: "It would seem that the present attitude toward home confinement requires re-examination, and a program looking toward an increase in the practice of domiciliary obstetrics deserves careful investigation." Again under "Midwife Practice" this statement is made: "To the Committee it seems fair to say that contrary to the generally accepted opinion, the midwife is an acceptable attendant for properly selected cases of labor and delivery." To quote again: "The relative safety of delivery at home should be emphasized. Effort should be made to induce women who cannot obtain adequate medical or hospital care to avail themselves of the services of qualified midwives under the supervision of physicians."

There soon rallied to our support in this study practically all of the hospitals in Cleveland doing obstetrics, both specialized maternity and general hospitals. We were astonished at some of the doctrines which were being promulgated and we applied ourselves to a study of facts as they existed in Cleveland. Our plan of organization and study, which has since been called the "Cleveland Plan," was as follows:—

There was obtained monthly from the Cleveland Health Office a copy of the death report of every puerperal death which occurred in hospitals or homes. We proceeded to a study of hospital cases in the following fashion: Each hospital was furnished with a list of its puerperal deaths since the last meeting and was requested to present through its representative a detailed case report of each patient. At each meeting this group of obstetric specialists who represented the various maternity departments of Cleveland hospitals, listened to these case reports, discussed them in detail and then acting as a jury decided the diagnosis, the propriety of treatment, accuracy of the officially stated cause of death, and all other considerations that seemed important in the management of the case. One of our first decisions was to separate viable from pre-viable deaths. It became clearly apparent that puerperal deaths occurring in hospitals as the result of abortions, ectopic pregnancies, et cetera, were in no way related to the efficiency or non-efficiency of obstetric departments of those hospitals. Since about 25 per cent of all puerperal deaths are due to abortions and since in most cases of fatal abortion the patients die of puerperal sepsis, comparison of rates including these causes are unfair. Thus far obstetrics in hospitals was vindicated. It soon became equally clear that while obstetric departments in general hospitals *can* be made safe places for delivery, many general hospitals *do not* make adequate provision for protecting their patients from septic infection caused by hospital conditions.

Voicing the judgment of our group, I presented a paper in which the following statement appeared: "It is a fact not sufficiently recognized, that conditions and surroundings found safe for general surgery are based upon intensive protection of a small area (the field of incision) for a short period of time. After the incision is closed it is covered with occlusive dressings and protected from further risks of infection. No such limited intensive protection is possible in obstetrics. During labor, which lasts from six to twenty-four hours or longer, the patient is stirring about; the perineum is contaminated by bowel movements; pads must be changed as they become

soiled, et cetera. After delivery is completed, occlusion of the field by dressings is still impossible. The tissues of the generative tract are bruised and lacerated, and this tract leads directly to the wide open sinuses of the placental site. The atria for infection remains wide open, until nature has had time to close them by building up a protective wall of granulations. Therefore, the space devoted to housing these patients, the attendants, the linen and the apparatus used, must be free from the slightest suspicion of recent contact with infection of any sort."

The following recommendations are concurred in by our hospital group:

STAFF ORGANIZATION

Every general hospital accepting maternity cases should have obstetric recognition in its staff organization. In the larger institutions there should be a regularly organized department with a trained obstetric specialist responsible for and directing the work of the division. In small hospitals, even in the small community hospital, it is possible to have a qualified man in the capacity of consultant in obstetrics. The advice of this man should always be available concerning matters of policy or technique.

PHYSICAL SEGREGATION

Delivery rooms, scrub rooms, nurseries and rooms for mothers should occupy one continuous unit of space, not interrupted by space used for any other purpose. This unit should be so situated that attendants and visitors to other portions of the hospital do not pass through the obstetric unit. Delivery and scrub rooms should not be located in one part of the hospital, while the nursery and rooms for mothers are located elsewhere. This arrangement offers opportunities for contamination. The obstetric unit should be a real physical unit, and is prerequisite to administrative isolation.

THE OBSTETRIC UNIT

Physical segregation of an obstetric unit combined with administrative isolation of this unit are conditions which should be fulfilled by every general hospital accepting maternity cases.

ISOLATION OF THE UNIT

This can be secured only when the administration co-operates heartily with the staff to make it effective. Nurses and maids caring for obstetric cases should not have contacts with patients of any other type. The linen used for obstetrics should be used exclusively for this purpose. The laundry should not be relied upon to destroy virulent pathogenic organisms with which linen may chance to be infected by a draining surgical case. Bed pans, douche bags, thermometers, irrigating apparatus and all other paraphernalia used in the obstetric ward should remain there and should not by any chance be borrowed for temporary use elsewhere! Such obvious and dangerous mistakes as building the delivery room into the surgical operative space; scattering obstetric patients throughout the hospital; using the same utensils for both surgical and obstetric cases; permitting the same nurses and maids to serve both types of patients, et cetera, would rarely occur if the administrator consulted freely with an obstetrician, or if such a man were in charge of the obstetric division.

A most important factor in reducing the incidence of sepsis is prompt removal of infected cases from the obstetric unit. The case that is frankly infected when brought to the hospital should not be taken to the obstetric unit for delivery. Any case which develops questionable symptoms after de-

livery should be transferred to some other part of the hospital. The baby should always accompany the mother when she is moved to another section. Not only does the general hospital have at command readily available space for this purpose, but it has, what is of even greater importance, a personnel continuously maintained which has not contacts with the obstetric division. The Maternity hospital must provide and maintain such accommodations.

As our studies progressed we were made uncomfortably aware of the fact that "neglect by family practitioners to call *early obstetric consultation* in the presence of serious pathological complications was responsible for a great many tragedies." We created the following device for securing such early consultation. General practitioners who were given the privilege of practicing obstetrics in a given hospital were to be formally organized as a so-called "Courtesy Obstetric Staff." One of the requirements for admission to this staff was assent in writing to the following pledge:—

The Ohio Hospital Association

The Hospital Obstetric Society of Ohio

Adopted July 21, 1937

"I, the undersigned member of the Courtesy Staff of ———— Hospital, hereby agree

(1) That the care of each of my patients admitted to the Obstetric Division of ———— Hospital, shall be subject to supervision by the Director of Obstetrics, or his chosen representative, whenever such supervision is advisable for the welfare of the patient.

(2) That I will attend the regular conferences, clinics and meetings of the staff as requested by the Obstetric Director.

(3) That I will make all reasonable effort to improve my knowledge of obstetrics and skill in its practice.

(4) That I will be subject to and will conform with such other rules and regulations as shall from time to time be made by the Hospital for the good of the service or the benefit of the patient.

(Date) ————————

(Signed) ————————

"The Ohio Hospital Association and the Hospital Obstetric Society of Ohio, wishing to improve the obstetric conditions in the several hospitals belonging to their societies, recommend that this 'Pledge' be signed by all physicians desiring to practice obstetrics in member hospitals as members of the Courtesy Staff.

"The purpose of 'The Pledge' is to secure early diagnosis and care of the patient by a competent obstetrician, when serious pathological conditions are present.

"When this purpose has been accomplished the Chief has no further authority under 'The Pledge' to supervise the care of the patient. 'The Pledge' gives to the Chief ethical rights, not legal authority.

"Other powers of the Chief such as: establishing standards and procedures, deciding who may do obstetric surgery, giving permission to do a cesarean section, et cetera, are conferred by departmental rules of the individual hospital and are not dependent upon signature to 'The Pledge.'

"The doctor who signs 'The Pledge,' promises in effect that

he will use his best efforts to induce his patient to cooperate with him in carrying out instructions given by the Chief.

"Under no circumstances does 'The Pledge' give the Chief authority to take personal charge of the patient.

"When visiting the patient of another physician, under the authority of 'The Pledge,' the Chief may advise the doctor—

(a) Ask an obstetrician to see the patient in consultation and follow his advice.

(b) Have the patient transferred to the care of an obstetrician.

(c) The pathological conditions present are not serious. You need not call for consultation unless further complications occur.

"For this service as departmental chief no charge should be made. If asked by the physician to act as consultant, he may charge for such professional service, as at any other time."

It is only fair to say that not all of our hospitals have complied with this request. Some of them objected that it gave the chief too much power. Most of them, however, established some sort of rule to accomplish this same end. Apropos of criticism of this pledge, which was endorsed by the Ohio Hospital Association, the principles of which are already embodied in the manual on Hospital Obstetric Standards published by the American Hospital Association, we take pleasure in quoting from a report of the College of Surgeons on "The Program of the American College of Surgeons for Maternal Care in General Hospitals" found in the Journal of Obstetrics and Gynecology, March, 1938, Section 5:

Supervision

"It is recognized that in most hospitals obstetrics is practiced largely by general practitioners and the work is not limited to qualified obstetricians. In the survey it was found that the obstetric staff was organized, although *frequently* too loosely and without sufficient positive supervision over actual work. *Active supervision by the chief or head of the department or service must extend to all types of patients rather than to the ward patients only.*"

The Cleveland Hospital Obstetric Society, and the Hospital Obstetric Society of Ohio organized two years later, are proud to believe that their groups were the first to clearly enunciate this principle as necessary for good hospital obstetrics. We are not a general obstetric society but a Hospital Obstetric Society and our studies and the statement of principles given below refer only to communities with good hospital facilities. We can perhaps epitomize the principles which we consider already established as follows:—

1. Secure hospitalization of as many women for delivery as the facilities of the community will permit.
2. We earnestly urge more complete organization of the obstetric staff in hospitals doing maternity work and that this staff should be given sufficient authority to insure suitable policies and technique.
3. We urge the complete isolation of the obstetric department, isolation of *space*, isolation of *personnel*, and isolation of *material*.
4. Regulations should be established to ensure early *obstetric* consultation for every patient who is the victim of serious pathological complications.

Various plans have been adopted to secure this result but we believe that in open staff hospitals our pledge for the Courtesy Obstetric Staff is a satisfactory method. Careful reading of this pledge and scrutiny of the interpretation which the society authorized will show that the chief has no autocratic authority and cannot benefit financially as the result of its practical working.

We have recently felt that our studies limiting themselves to women who die, while illuminating, might well be supplemented by some form of study of the management and outcome among the women who recover. We have, therefore, adopted a form which we call a "Report of Hospital Service" which each hospital is requested to send in monthly to our secretary. This report gives the number of deliveries, number of non-operative cases, types of operative deliveries, morbidities, ectopic pregnancies, abortions, number of stillbirths, number of live births, neonatal deaths, birth injuries, nursery complications, those who have developmental defects, et cetera. This report is not so long and detailed as to be burdensome but does give a bird's-eye picture of the work of the individual hospitals which, we believe, is new and will be of clinical value.

I should like to add a personal statement to this formal report on the work of our society. I believe the whole matter of maternal deaths so far as hospitals are concerned can be stated very briefly. A good hospital is the safest place on earth for a woman to have a baby; a poor hospital is the most dangerous place for a woman to be delivered. Large communities can reduce the maternal mortality to a minimum by insuring rigid standardization of hospital procedures and enforcing the rule of early obstetric consultation with transfer of the care of the patient to a competent obstetrician if complications prove to be serious.

Prenatal work in Cleveland has greatly improved in the last few years. We have constantly emphasized the need for better prenatal care. The Cleveland Child Health Association has an arrangement with the Cleveland Academy of Medicine whereby (under Academy supervision providing suitable protection for the interest of the individual physician) systematic prenatal teaching has been given to a large number of women. Most of these women belong to the no-pay or part-pay group but some of our Cleveland physicians refer private patients for class instruction in prenatal care. This instruction has given valuable support to our attempt at securing better obstetrics.

While this is primarily only a report of the work done in Cleveland by the Cleveland Hospital Obstetric Society, it is only fair to state that the work of our state organization, the Hospital Obstetric Society of Ohio, has been supported very ably and cooperatively by the State Department of Health. In connection with grants from the Children's Bureau in Washington, the Department of Health has been carrying on a rather extensive program for postgraduate lectures to general practitioners throughout the state. A similar course of lectures has been arranged for by the Ohio State Medical Association as part of its program for general postgraduate education.

Please note that the figures in Tables 1 and 2 include all deliveries made in the respective communities, both in the home and in the hospital; that they represent the average outcome of the work of all classes of doctors, both specialists and general practitioners. The work which we have been doing

unfortunately gives no immediate answer to the problem of better obstetrics in rural communities. We believe that our results do show that a return to home deliveries is not advisable but that the real solution is better hospitals and more of them, better supervision and earlier consultation with trained obstetricians. Such results as are obtained in the Chicago Maternity Center or in various closely supervised University clinics, working in the home, are impossible in private practice because the highly trained supervision is missing. If you can get the patient to the hospital, you can supervise and you can give that supervision teeth when necessary.

In Cleveland last year, 77 per cent of the deliveries were hospitalized. Another 10 per cent were delivered in their homes by the University Clinic in which most rigid supervision was practiced. This made 87 per cent of Cleveland deliveries either hospitalized or having hospital-trained supervision. We believe that such supervision of general obstetric practice is a vital factor in lowering our maternity mortality rates.

CLEVELAND STATISTICS — TOTAL BIRTHS

TABLE 1

Year	No. of Deliveries	No. of Puerperal Deaths	Percentage Puerperal Deaths	No. of OB. Deaths	Percentage OB. Deaths	Percentage Hospitalization
1930	18,613	120	6.45	71	4.03	55.2
1931	16,871	118	7.0	74	4.6	56.7
*1932	15,708	76	4.83	51	3.24	58.9
1933	14,202	81	5.7	54	3.8	58.2
1934	14,742	74	5.02	44	2.92	61.9
**1935	15,218	87	5.71	65	4.25	67.5
1936	15,606	61	3.9	44	2.75	71.8
1937	16,301	55	3.37	37	2.27	77.

*1932—Hospital Obstetric Society organized.
**1935—Puerperal sepsis epidemic in one hospital.

We refer those who advise that home delivery is safer than hospital delivery to the last two columns in Table 1. Note the steady decline in mortality as the rate of hospitalization increased.

TABLE 2

	Births	Puerperal Death Rate 1931-1935 Average	Puerperal Death Rate 1937
Cincinnati	8374	7.19	6.81
Columbus	5340	10.35	7.14
Toledo	4753	7.83	4.62
Akron	3951	6.37	3.55
Dayton	3932	7.55	2.80
Youngstown	3268	10.13	5.81
Canton	1717	8.87	6.41
Hamilton	1112	4.86	2.70
Elyria	579	10.76	3.46
Cleveland	16301	6.09	3.37
Totals	49327	8 per 1000	4.5 per 1000

The State Society was organized two years later than the Cleveland Society. The results are not so striking but the improvement made is clear.

THE USE AND ABUSE OF CARBON DIOXIDE IN GENERAL ANESTHESIA

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The purpose of this paper is not to announce any startling discovery in regard to the use of carbon dioxide in relation to general anesthesia, but rather to recall to and focus our attention on the tremendous help its efficient control or the equally tremendous hindrance its haphazard use can be to us.

We are all familiar with the mechanics of respiration and with the fact that carbon dioxide is the normal respiratory regulator and stimulant. It is produced in the body by the metabolic activities and approximately 95 per cent of the amount produced is eliminated by exhalation.

Dr. Waters has observed that "the control of carbon dioxide elimination and oxygen intake is an essential corollary of all *good* anesthesia."

We are concerned with carbon dioxide rebreathing in relationship to:

1. Smooth, rapid induction, with consequent minimum excitation.
2. Proper exchange of gases in lungs and tissues to insure maximum anesthesia with minimum circulatory and respiratory disturbance.
3. Elimination of the anesthetic agent at the close of the surgical procedure.

We utilize carbon dioxide to deepen the initial respirations, thus obtaining a smooth, rapid induction and a quicker diffusion and absorption of the anesthetic agent. This in turn shortens the period of excitement with its accompanying muscular spasms. This reduction in muscular reaction is due to the fact that carbon dioxide aids in supporting the tone of the tissues; and if properly controlled, the amount of body fluid lost through excessive perspiration is lessened.

Carbon dioxide aids in the maintenance of the proper exchange of gases by:

1. Delivery to the patient of a mixture of gases warmed by the heat generated by the reaction of carbon dioxide and the soda lime through which it passes. "Breathing a cold, dry atmosphere is known to result in irritation of respiratory membranes, to stimulate respirations, and tends to decrease body temperature and to increase perspiration."[1]

2. This atmosphere is warmed by vapor from the patient's own exhalations, thus reducing the danger of postoperative lung infections. By attempting to maintain the normal respiratory cycle we lessen the possibility of syncope and collapse caused by disturbance of the acid base balance of the blood which is normally controlled by the carbon dioxide content.

3. Elimination of the anesthetic agent is promoted by increasing the rate and depth of the respiration at the close of the surgical procedure, thus flushing the lungs and tissues of retained anesthetic, and providing them with oxygen.

Thus we see the direct physiological advantages of carbon dioxide rebreath-

* Read at the annual meeting of the New York Nurse Anesthetists' Association, held in Buffalo, N. Y., May 19 and 20, 1938.

ing. In addition, we might add that fire and explosion hazards are reduced. The surgical team may work in an atmosphere free from obnoxious and toxic anesthetic gases, and an enormous economy is effected.[2]

Now let us look at the reverse side of the picture and note in what manner and why the misuse of carbon dioxide constitutes a serious handicap. According to Dr. Rovenstine:

"The aim of clinical anesthesia is to obtain obtundation of the patient's reflex irritability with minimal physiological disturbances. When attempting to achieve this ideal by inhalation methods, one is constantly confronted with unphysiological disturbances of respiration. The control of normal respiration is accomplished by a normal functioning respiratory center, assisted by natural muscular activity and unhampered by obstructed airways. The anesthetist will, of necessity, invariably alter one or more of these regulating factors. Not the least disturbing is the attempt to maintain the respiratory center as it prevails in nature." (As we know, this center is regulated by the carbon dioxide content of the blood.) "It has been determined that the stimulating effects are evident until concentration in the inspired atmosphere of 30 per cent carbon dioxide is reached. These figures, however, are based upon normal individuals in a normal environment. In surgery we do not usually have normal subjects. Rather, due to existing disease, the presence of hypnotic drugs and the changed environment, abnormalities are the rule. In the latter circumstance, the figures are extremely variable. Any increase in carbon dioxide inhaled may, under certain conditions, act as a respiratory depressant. The adjustment of oxygen, in addition to the regulation of carbon dioxide so that the nervous cells of the respiratory center may secure the considerable amount needed to satisfy their metabolic needs, is essential. Moreover, a reduction of the normal blood oxygen content produces rapid breathing and decrease carbon dioxide, apnea, and finally failure of the respiratory center. This effect is likewise extremely variable and depends also upon the condition of the patient. From the foregoing, it is an obvious deduction that an accurate control of carbon dioxide elimination and oxygen intake is essential to inhalation anesthesia."[3]

I do not mean to speak as an authority nor as one who has devoted twenty-five or thirty years to the administration of anesthetics, but I have been in operating rooms where I have sometimes noticed the too "indiscriminate" use of the soda lime absorber. Abrupt changes in the mixture being administered to the patient are certainly not conducive to smooth, safe anesthesia, and result in embarrassing and sometimes alarming situations caused by the sudden transition from hyperactive to depressed respiratory activities. I feel that when the respirations first begin to accelerate and deepen beyond the desired point, if the absorber chamber is opened just a fraction and the soda lime given time to take effect, and then slight, gradual adjustments made until a satisfactory level is obtained, we are giving the patient the proper benefits of rebreathing.

We all use carbon dioxide rebreathing, and I believe that those who use it a little carelessly do so because they do not fully appreciate the distinction between *tonic* carbon dioxide, meaning the correct amount necessary to individual requirements, and *toxic* carbon dioxide—what is a tonic amount for one patient may be a toxic amount for another. Since we have, so far as I

know, no method of estimating beforehand the exact amount of carbon dioxide a patient will manufacture by his own metabolism, or how much is needed to maintain his normal respiratory cycle, or what percentage will be toxic to that patient—in other words, since we have no way to estimate, maintain and eliminate carbon dioxide in perfect ratio to each patient's requirements, painstaking care on our part in trying to find and maintain that perfect balance represents the nearest we can hope to come to the ideal.

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CYCLOPROPANE

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Anesthesia affects the comfort and safety of at least fifty per cent of the patients admitted to a general hospital. For that reason it should be kept well in the foreground of scientific advancement. For many years it was neglected but in the past fifteen or twenty years there has been marked progress. The concern of all anesthetists should be: (1) the safety of the patient, (2) the comfort of the patient, (3) the convenience of the surgeon. In the search for anesthetic drugs which would fill all these requirements numerous agents have been brought into use, each having special advantages and each also having, unfortunately, disadvantages.

I do not believe it necessary in this report to review the scientific data published concerning cyclopropane. We have probably all studied the same literature and consequently have quite similar fundamental knowledge of the subject. For that reason I shall consider it merely from the standpoint of its use at St. Joseph's Hospital.

On July 14, 1937, one machine equipped for cyclopropane was installed at St. Joseph's Hospital. Our first cases were selected carefully and we proceeded cautiously, but within six weeks it was necessary to install the second properly equipped machine as the gas was accepted enthusiastically by the surgeons.

It is said that there are as many methods of induction as there are anesthetists. That is probably true, since no two people can work exactly alike and no two patients respond in an identical manner. The skill, experience and judgment of the anesthetist are much more important than the methods and agents used. To quote from Romberger: "There is no standard—watch the patient."

Our technique of induction differs somewhat from that outlined in the literature. We felt it wise, in the beginning, to make as little change as possible in our routine technique of anesthesia, and we therefore used the sequence method, which was so satisfactory that we have continued to use it. We use the familiar induction with ni-

* Read at the annual meeting of the Texas Nurse Anesthetists' Association, held in Houston, Texas, April 9 and 10, 1938.

trous oxide, but we do not wash out the exhaled nitrogen. Induction having progressed to the point where another agent, ethylene or ether, is indicated, the oxygen is set at 500 cc. per minute, the filter turned on full and cyclopropane flowing at the rate of 600 cc. per minute is given for one minute. One minute is then allowed for absorption, after which cyclopropane, 300 cc. per minute, is administered for two minutes. One minute intervals for absorption are allowed until 1800 to 2400 cc. of cyclopropane have been consumed or until relaxation has been obtained. Thereafter cyclopropane is added only as necessary to maintain relaxation. The usual addition is 300 cc. per minute for one or two minutes but in stubborn cases we have found it satisfactory to maintain a flow of 50 to 100 cc. per minute for from five to ten minutes. The oxygen and the filter are regulated according to the respiration and color. The rest periods for absorption are most essential because the gas is potent and overdosage develops rapidly. Regardless of the impatience sometimes evidenced by the surgeons in difficult cases, this anesthetic cannot be hurried safely. Should satisfactory relaxation not be obtained, it is simple and safe to bring ether into the sequence and 20 to 40 cc. are usually sufficient. The statement has been made that to add a few "whiffs" of ether cannot be an aid in anesthesia, and that saturation must be obtained with it in order to be of any value in securing relaxation. However, probably due to the closed rebreathing system, this is not true as very little ether is required when added to cyclopropane. As the surgical procedure nears its end and relaxation is no longer necessary, the cyclopropane is discontinued, the bag is usually emptied and the anesthesia is carried on with nitrous oxide, ending with a thorough washing with oxygen and carbon dioxide.

This sequence technique has been very satisfactory in every way and induction is quickly accomplished. Our patients are prepared, draped and ready for abdominal incision in ten minutes and awaken quickly and with almost no nausea after the vomiting reflex has been passed. We believe that the conclusion with nitrous oxide may have some bearing on the fact that we have had no postanesthetic depression which is considered by some to be caused by the high oxygen content used in cyclopropane anesthesia. Another great advantage has been that the surgeons have felt reassured and confident, knowing that the gas is synergistic with the familiar anesthetics and may be used along with them.

The old maxim, "When in doubt use oxygen," is most applicable in cyclopropane anesthesia. The difference in the signs of anesthesia from those seen when the older agents are used is confusing at first. The shallow, slow respirations make the depth of anesthesia difficult to recognize at times and the eye signs are of little value. The most valuable signs are the pulse and the respiration. Arrhythmia, slowing of the pulse to 50 or below, or a definite increase in the pulse rate are signs of too deep anesthesia and call for the addition of oxygen. The respirations in too deep anesthesia become very slow and shallow and unless the anesthetic is lightened may cease although the color remains pink. Being accustomed to the older gases we are tempted to use carbon dioxide at this point but authorities state that it is definitely contraindicated. Reduction of the anesthetic concentration by the addition of oxygen is, however, indicated. If a high oxygen content has

been maintained, the occurrence of respiratory arrest need not cause undue alarm. Emptying the bag of cyclopropane, filling it with oxygen and inflating the lungs a few times by making pressure on the rebreathing bag will usually bring about respiration. If the condition persists to the point of cyanosis and a stimulant appears to be necessary, coramine is the one of choice since it is considered to have a definite stimulant action on the heart and respiratory center and because its toxicity is low, large doses can be given if indicated. Respiration having been reestablished, cyclopropane may be continued. In overdosage the respiratory system fails before the circulatory system. This places cyclopropane in the group of safe anesthetics.

Preliminary medication is as important to cyclopropane anesthesia as it is to any other. We have used many drugs in varying dosages or none at all. Our best results have been obtained with nembutal grains 1½, sodium amytal grains 3, or sodium luminal grains 4 to 6, given one and one half hours preoperatively, followed by morphine sulphate grain 1/6 to ¼ with atropine sulphate grain 1/150 given thirty to forty-five minutes preoperatively. We especially like nembutal grains 2, given as a rectal suppository two hours preoperatively. Patients having been given any of these premedications have arrived in surgery in a sleepy, disinterested state and the induction and maintenance have been smooth. A much lower concentration of the anesthetic has been required than for patients with less, or with no, premedication. Of course, too great a dosage of barbiturates is to be avoided due to the resulting respiratory depression, although the amounts mentioned have been very satisfactory. Avertin, 60 to 70 milligrams per kilogram of body weight is an excellent basal anesthetic. Our emergency abdominal cases, without premedication or with premedication given ten or fifteen minutes preoperatively, have not been successful and it has been necessary in some cases to add ether to the sequence and in some cyclopropane has been abandoned entirely for ethylene-ether. However, emergency abdominal cases seldom go smoothly, possibly due to the excitement always present without preliminary preparation to counteract it. Again we say, cyclopropane anesthesia cannot be hurried safely and to obtain relaxation in the unprepared emergency abdominal case more time and patience is required.

The precautions used against the explosion hazard of cyclopropane are the same as we have observed with ethylene for years. Moisture inside the anesthetic machine is important, and is obtained by running water through the breathing tubes and the breathing bag. This moisture, augmented by the moisture of the patient's expirations, tends to decrease the danger of accidents from static within the machine. Wet towels over the mask and over any part of the machine which might leak, protect from static outside the machine. Static spark will not occur in a moist atmosphere. Electrical connections in the operating room must be kept in good repair and the anesthetist should be warned in advance when a connection is to be made or broken. With these precautions, and by turning off the cylinder when cautery is being used, no hesitancy is felt in using the cautery in vaginal or rectal work, or in any area beyond the screen in abdominal surgery. Preceding the use of the cautery it is advisable to pass a slight current of air through the operating room if possible, as the gas, being heavier than

air, may, if there are any leaks around the mask, coast along the edge of the table or collect in pockets in unventilated areas of the room. Of course, the use of cyclopropane in the presence of the x-ray or the high frequency equipment, such as the Bovie unit, is absolutely prohibited. No open flame or smoking is allowed. The cylinders are turned off and the bag and tubes emptied before the anesthetic machine is moved.

In addition to the other usual abdominal cases, we have used cyclopropane in 435 cases, including 269 major and 165 minor operations. The major group includes:

Gynecological laparotomy	102
Cholecystectomy	10
Gastro-enterostomy	2
Cesarean section	4

The patients in this series have varied in age from two to eighty-five years. There have been no deaths that could be attributed to the anesthetic. There has been no postanesthetic depression and very little postoperative nausea and vomiting. In one case only a period of respiratory arrest developed and while it persisted to the point of cyanosis, the patient responded to stimulants and oxygen and made an uneventful recovery.

The cholecystectomy patients have been nicely relaxed and have had no postoperative vomiting. Anesthesia for the cesarean section has been satisfactory and the babies have cried immediately upon delivery with the exception of one in which case the mother had been given morphine sulphate grain 1/4 thirty minutes before delivery, and as a result the baby required resuscitation. One patient, a rather wiry individual, came to surgery for gastro-enterostomy without premedication. He was given cyclopropane 1200 cc. and ether 30 cc. while the incision was made and exposure obtained. Thereafter he was carried on cyclopropane for one and one-half hours, the total amount used being 4,200 cc. The abdomen was perfectly quiet for closure and the patient reacted in fifteen minutes without nausea. The pulse never exceeded 96 in the two hours of surgery. The gynecological laparotomy series has showed very satisfactory relaxation and only in a few instances in this group has it been necessary to add ether.

We have been especially pleased with cyclopropane in minor surgical operations. For the scheduled minor case which has been prepared and premedicated, 600 to 900 cc. of cyclopropane has been sufficient. Reaction has been prompt and nausea and vomiting practically absent. In the emergency minor cases the results have been almost spectacular. The majority of these cases have been automobile accidents and industrial cases, such as fracture, extensive laceration, abscess, et cetera. They come, of course, unprepared and unpremedicated and most of them cannot be handled with ethylene without ether. Cyclopropane has given sufficient anesthesia and the after-effects of ether have been avoided.

The series has included one patient with active pulmonary tuberculosis, two patients with arrested pulmonary tuberculosis, five with enlarged hearts, six with cardiac lesions, one with acute bronchitis, four with acute upper respiratory infection, four with diabetes and a number with hypertension. The recoveries have been uneventful with no apparent untoward results. Four women with pregnancies of from three to five months made uneventful recoveries with no interruption of the pregnancies. Convalescence has been shorter following cyclopropane anesthesia

because the one to three day period of nausea and vomiting with the attendant discomfort and dehydration is absent.

The only objection we have heard to the use of cyclopropane is the increase in bleeding, which necessitates more time in obtaining hemostasis. The question is open as to whether there is a definite increase in bleeding or whether, due to the high oxygen content of the anesthetic mixture, the tissues and blood are so highly colored as to give the impression of a greater increase in bleeding than actually exists.

The total cost of our anesthetics has been reduced. The price of a cylinder of cyclopropane seems exorbitant but such a small amount is used that the cost per case is very low. However, our consumption of oxygen has been doubled, but the consumption of nitrous oxide, ethylene and ether has dropped to a minimum.

I think I can best conclude this report by quoting a statement made by one of our surgeons who was asked recently to give his attitude concerning cyclopropane: "I think cyclopropane as an anesthetic is far superior to all of the others. However, there are two things I think of importance in its use: (1) It requires intelligent, scientific handling and is not an anesthetic for just anyone to give. (2) The anesthetist should insist that the anesthesia reach the desired level before surgery is started. If a few extra minutes are required, the time lost is of no consequence as compared to the nicely relaxed patient when the anesthesia has been established."

I believe cyclopropane is safe only so long as we remain afraid of it. So long as we continue to be as cautious as we were with our first cases, accidents will be less likely to happen and we must guard against becoming overconfident.

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THE NURSE ANESTHETIST

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Probably no other subject is of more importance or immediate interest to us today than the status and work of the nurse anesthetist. During the past year much publicity has been given this subject and it has been presented from various angles but not always upon a basis of authoritative information or unbiased consideration. This increasing publicity has aroused in the mind of the layman, and brought to the consciousness of the medical profession to a greater extent, an unusual interest in the future of the nurse anesthetist.

Before we look to the future, let us briefly review our past history. Thirty years ago in one of the leading hospi-

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tals in the country, the prominent surgeon Dr. Mayo and later Dr. George W. Crile first engaged the services of a nurse anesthetist. Soon after many other renowned surgeons and leading hospitals throughout the country followed the example. At that time it was definitely an experiment but as a result of the efficiency of our pioneer nurse anesthetists, some of whom are present here today, approximately 95 per cent of the hospitals all over the country have on their staff one or more nurse anesthetists rendering safe, satisfactory and economical service and the matter is now far beyond the experimental stage.

We must correlate theory with practice and the administration of anesthesia is an art which, like all others, must be practiced constantly to reach perfection.

We are well aware of the many advances and changes taking place in both the medical and nursing professions—group hospitalization, the merit system and many other progressive methods, and as a part of this service to humanity we must be prepared to face the conditions arising from these changes. We must also be prepared to answer the questions which are asked openly or which arise as the result of the present day discussion of the status of the nurse anesthetist.

The legality of our profession has been questioned by some speakers and writers. This query can be answered readily. At the present time there is no state in the Union where the administration of anesthetics by nurses *especially trained,* is considered illegal or as the practice of medicine. In carefully reviewing the Medical Practice Acts of the various states the final conclusion is practically unanimous, namely: that it is *not* unlawful for a nurse to administer anesthetics providing the administration is under the direct supervision of a licensed physician. With the advent of some newer anesthetics the administration of which are surgical procedures, there can be no doubt as to the assumption of the responsibility. I refer to the administration of intravenous, caudal and spinal anesthetics.

Among the major projects of the National Association of Nurse Anesthetists education has always been stressed, not only as necessary but as continuous and never ending. We must keep in touch with every phase of the work, with each new development and experiment, with every suggestion that will increase our ability and enlarge the scope of our life's work. There is so much in the line of research to be carried on and so much progress to be made that we must, in order to succeed, always work hand in hand with the physician.

Through the years since Dr. Mayo made his experiment, the nurse anesthetist has proved herself valuable in this field. Her sympathetic understanding and her knowledge and skill are invaluable in instilling a feeling of security in the patient and the surgeon. I mentioned earlier that the nurse anesthetist chooses her profession as her life's work—this is so in the majority of cases. She has no idea of becoming other than a most competent aid to the surgeon and therefore her goal is to accomplish for her patient and the surgeon the best results in anesthesia.

There has also been much discussion in regard to the nurse anesthetist from the economic angle. The salaries of institutional anesthetists vary from $75 to $200 per month including maintenance, depending upon the size of the hospital and its location. It is a known fact that many of these anesthetists are

required to combine duties. Although we do not advocate this practice, we realize that there is insufficient surgery in some hospitals to warrant full-time anesthetists. In such cases the anesthetist should not be called upon to perform actual bedside nursing, because an emergency operation might necessitate her leaving the patient in the midst of a treatment. Her duties should therefore be combined with the library, medical records, x-ray or laboratory personnel. When you consider that most hospitals charge a flat rate of $10 to $25 for the use of the operating room including the anesthesia, but no additional charge made for its administration and such service available twenty-four hours a day, how can it be said that "medical anesthesia is an economic asset to the hospitals while nurse anesthesia is an economic liability?"

What about the safety of the patient in the hands of the nurse anesthetist? It has been my personal experience during the past fifteen years in one institution to administer approximately 40,000 anesthesias with only three fatalities attributed directly to the anesthesia—two cases being spinal and the other ether. There is no doubt but that any number of nurse anesthetists engaged in this profession can present similar satisfactory statistics. So much for the past and present of our profession, but what of the future?

In the first place, I believe that we must educate the public. It is public opinion that makes our laws and it is public opinion that carries them into effect. The public as well as the medical profession must be aroused to the reality of the purposes and accomplishments of the nurse anesthetist during the past thirty years. If the medical profession has an open mind, it cannot fail to realize the outstanding achievements of the nurse anesthetist during this period. There may be some who doubt, there may be some who are biased, but *results* speak for themselves and the fine work accomplished in the past in the practice of anesthesia should be the measure by which the medical profession can arouse public opinion in our favor. The record of our past success can be the measuring stick of future achievement, however, only if we continue to do our part.

The founder of our national organization has devoted much time and effort in developing the standards whereby we can continue to have the cooperation, support and help of the surgeons. She has advocated increasingly higher standards of training for anesthetists even to the point of placing the entrance requirements to our schools on a level with the college courses that are required in other departments of surgery and nursing. She has gone further and suggested the seal of a Board of Examiners as necessary to the raising of the standards of our profession.

These suggestions should bear fruit and they should be carefully considered as steps in the future. This program will require courage, interest, determination and the will to serve in unity of purpose if our future is to be assured. No one can sit idly by. Together we must vision the road which lies ahead of us. It is filled with obstacles which we must overcome, but it beckons and challenges us to newer achievements, broader viewpoints and a firmer determination to attain our objectives.

SUMMARY OF ANESTHESIA IN OTOLARYNGOLOGY

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Every surgeon at one time or another has experienced that tense atmosphere and moment when things are not proceeding smoothly and the patient stops breathing during an operative procedure. It takes only one such experience to create a memory of indelible quality.

I shall discuss the anesthesia methods employed in the Ear, Nose and Throat Department of our hospital. First of all let us consider the tonsil and adenoid problem. Preoperative medication for children is usually a hypodermic of atropine. Nitrous oxide induction (95 per cent nitrous oxide, 5 per cent oxygen) followed by ether vapor fed through a Jennings mouth gag throughout the operation, is used. This procedure is identical for adults except that the preoperative medication is morphine and atropine. It seems to me that preoperative medication in any surgical case reduces the time required for induction, reduces the amount of dangerous secretions during the induction and operative stages, and helps to procure a smoother, more easily maintained anesthesia. While morphine produces a quieting of the psychic reactions, how often under its influence do we see patients brought into the operating room, which probably they have never seen before, with nurses and tables of instruments in plain view and gas tanks and other frightening gadgets standing about, only to have this docile patient suddenly become alert to this scene and completely destroy the effect of the morphine. Even as well educated as I am to operating room atmosphere I do not want my own anesthetic given under this influence. A room properly fitted outside of the operating room should be used for the induction. If the anesthetic choice is a local, our preoperative medication is usually a barbiturate, using submucous injection of the peritonsillar tissue with 1 per cent novocaine. Local tonsillectomies I believe do better in the prone rather than the upright position. I have removed successfully with full cooperation, using barbiturates and novocaine, the tonsils of a child not quite twelve years of age.

We are rather proud of our low incidence of lung abscess following tonsillectomy. That is to say, of the cases that were operated on by us we have a record of only three cases of lung abscess since October, 1920. I grant that there may have been more such complications treated in other hospitals of which we are not aware, as we have seen lung abscesses following tonsillectomy performed in other hospitals. I do not use suction to remove blood from the pharynx during a tonsillectomy. It is another instrument in the way and with our technique all blood can be removed with gauze sponges. However, this low percentage of lung complications we attribute to our technique, which I will sketch briefly.

Immediately following enucleation of a tonsil the head board is lowered to

* Read at the annual meeting of the Pennsylvania Association of Nurse Anesthetists in Pittsburgh, Penna., April 27 and 28, 1938.

favor drainage of secretion into the nasopharynx. After all bleeding is controlled on the side of the enucleation and the throat is thoroughly mopped dry, the head is again raised to the level position and the second tonsil enucleated, when again the head is lowered and bleeding controlled. With the head still lowered the adenoids are next removed, after which the patient is turned on his stomach and well over the side of the table until all adenoid bleeding is controlled. Again, you see, drainage is away from the trachea. Just before the patient leaves the operating table and is still on his stomach the nasopharynx is cleared of all clots and the larynx and trachea drained of excess mucus by holding and lowering the patient well over the table until free, unobstructed "dry breathing" is obtained. On leaving the operating table the patient is placed on the stretcher on his stomach and in this position placed in bed, when he is again drained over the side of the bed. All effort throughout this operative procedure is to favor drainage away from the tracheobronchial tree and toward the nasopharynx. Gas anesthesia is not the choice for tonsillectomy but occasionally it must be resorted to and I believe the crux of its success is to deliver the anesthetic by means of a rubber catheter to the level of the larynx, under sufficient pressure, and then give the anesthetist plenty of time, twenty minutes or more, for saturation before proceeding with the operation. I grant you the peak of tolerance is sharp, but given plenty of time, the relaxation and absence of throat reflex is quite complete and enucleation does not have to be done hurriedly.

While avertin is coming into favor more and more as an anesthetic I feel that it should be kept essentially a basal anesthetic in operations about the nose and throat. Heavy doses, producing prolonged postoperative narcosis with loss of reflexes, prevent a cough which might dislodge an infected mucus plug from a bronchus with its attending cycle of events leading up to a lung abscess.

Submucous resections are performed under local topical anesthesia using 1 per cent pontocaine or a mixture of 15 grains of cocaine hydrochloric to 3 drams of water and one dram of adrenalin, making about a 7 per cent solution of cocaine. In this percentage cocaine poisoning is infrequent and I believe this annoying feature is further preventable by the liberal use of barbiturates preoperatively. All intranasal operative procedures requiring topical anesthesia—antrostomy, turbinectomy, knocking down the face of a sphenoid, et cetera, receive 3 grains of sodium amytal the night before operation, 3 grains at 9:00 the following morning and again 3 grains when sent to the operating room that afternoon. The patient is treated psychologically and fear with its attending increase in metabolic processes is much reduced. Mastoids, both simple and radical, are done under nitrous oxide-oxygen anesthesia entirely. Occasionally a husky, obstreperous individual will need some ether vapor in addition. In adults, preoperative medication with morphine and atrophine is the rule.

The administration of the anesthetic in radical sinus surgery is most important. Caldwell Luc, trans-antral ethmoidectomy, and external ethmosphenofrontal operations are included in this group but I wish to speak in detail of the latter—the so-called Lynch operation. These operations are of necessity bloody and as a rule are time-consuming, so that the anesthetic technique should be given serious con-

sideration. The filtering of blood and the always infected secretions toward the larynx and the great possibility of their aspiration must be prevented. The shock of a lengthy, protracted anesthetic must be reduced to a minimum. Careful preoperative and postoperative support must be given the patient and full cooperation between the anesthetist and the surgeon must be attained and maintained. The operation can be stopped at any stage, to be resumed at some later time. This type of surgical procedure I feel is one that takes meticulous care, patience and skill if expected results are to be obtained. Speed should be dispensed with.

Avertin has certainly found its place in this field and has made it possible to use nitrous oxide and oxygen as a supplement to carry on its effects. It can be used in the average case—advanced liver or kidney disease and old age being contraindictions. Admission to the hospital forty-eight hours in advance of operation is wise. Blood chemistry, urinalysis and blood pressure are taken and recorded, weight and height are ascertained; a complete physical examination is done and consent for the operation obtained regardless of age. I presume we use the 80 milligram per kilogram table more often than any other.

In anticipating the use of avertin, the patient is given an enema the night before, also 3 grains of sodium amytal at bedtime and again at 11:00 o'clock the next morning, assuming that the operation is to be performed in the afternoon. With the patient basically anesthetized our next problem is to deliver nitrous oxide by way of an airway with a semi-closed method. At first we used an ordinary rubber airway with a short piece of metal tubing coming off at right angles from its exposed end, to which the flexible tubing from the gas machine was attached. Obviously this airway necessitated thorough packing of gauze into the mouth cavity around the pharyngeal end of the airway to prevent too much dilution with air, and also to thoroughly jam the soft palate against the pharyngeal wall to prevent extravasation of blood into the pharynx. As a makeshift this worked pretty well but after obtaining a Leech pharyngeal bulb airway the older procedure was abandoned. We find this pharyngeal bulb airway adaptable to the average pharynx. Gauze is packed in between it and the soft palate to completely shut off the pharynx proper from the epipharynx. The bulb is then attached to the gas machine by a short piece of rubber tube. Free, even, effortless exchange of the anesthetic is in this way possible and can be carried on for several hours. The gas machine is usually placed along the side of the operating table toward the foot, with the anesthetist between it and the patient's head, and the surgeon is free to move about the head and the other side of the table. The eyelids of the patient are well vaselined and the operative field prepared with merthiolate. The eye on the operated side is further protected by suturing the upper and lower lids together with a single horse hair suture. Sand bags are placed at either side of the patient's head to prevent rolling, and drapes are applied.

Knowing that this operation takes a long time and that loss of blood is going to be great, the heart rate and the blood pressure are observed by the anesthetist throughout the operation. Ten per cent glucose in normal salt solution is always ready to be given intravenously but is usually deferred until the end of the operation — 1000 to 2000

cc. given on the table. Coramine intramuscularly or, better, intravenously, we have found the best drug to stimulate respiratory or circulatory depression. These patients are placed in a warm bed but not kept too warm or too moist. About 8 ounces of olive oil are instilled high into the rectum. During postanesthetic recovery plenty of fluids are given intravenously if necessary. Usually there is surprisingly little pain complained of, so that opiates should not be resorted to until absolutely necessary, then in small doses and only after the patient has completely reacted.

As a fitting conclusion, may I state that the responsibility for a patient before, during and after an operation rests squarely on the shoulders of the surgeon, but also immediately upon the anesthetist during the operation. The security the surgeon feels, the unhampered adroitness with which he can go about his work, the way in which time can be expedited, is when he knows he has a competent, conscientious, alert, attentive anesthetist at the head of the table.

THE NURSE ANESTHETIST IN THE SMALL HOSPITAL

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Anesthesia is a highly specialized field of hospital service, requiring people who have had a broad nursing experience and an intensive scientific training in anesthesia.

When a nurse anesthetist is employed in a small hospital the situation is somewhat different from that in an institution which requires a large staff. In view of the fact that there is but one anesthetist in the small hospital she should have an adequate amount of training and experience because she alone will be available for all types of cases. She should be a graduate of a school of anesthesia conducted by a hospital that offers a wide variety of surgical cases and utilizes all the anesthetics accepted today; also a school that gives a thoroughly outlined theoretical training in anesthesia. The school should give to the student an exact understanding of her responsibility to the patient, the hospital and the surgeon so that she is able to adjust herself to her position with tact and judgment. In order to be fully prepared for the position of a sole anesthetist in an institution, she should obtain a wider practical knowledge after graduation by taking a position as a junior member of a well organized anesthesia department in a large hospital for about two years.

In a hospital requiring the services of an anesthetist for a few hours a day only, the anesthetist may be able to combine her work with some other duties in the institution. She might take charge of records. This combination would be of value to both the hospital and the anesthetist. In many of the small hospitals the keeping of

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good records is somewhat of a problem and the anesthetist's knowledge and training as well as the constant contact that she has with the surgeon makes her particularly well fitted to analyze and summarize for a permanent record the patient's course in the hospital. Such experience would be beneficial to the anesthetist, as the average anesthetist in a large hospital does not always have the chance to follow the patient through to discharge.

The combination of anesthesia with x-ray or laboratory work is excellent providing an individual can be found who is first of all a good anesthetist and at the same time has knowledge in these other two specialties. A real training in laboratory work takes from eight months to one year and the same for x-ray. Is it possible to find a person who has spent so much time in preparation, who would be willing to work for the remuneration that can be offered by the small hospital? If the hospital departments are so organized that some doctor in the institution can train the anesthetist to do the routine laboratory and x-ray work required in the small institution, there is no reason why this combination would not work out to the satisfaction of the institution and the anesthetist.

In the small hospital laboratory work is usually limited to minor procedures such as blood counts and urinalysis, and the equipment in x-ray is usually such that the work in that department is limited, consequently a combination of anesthesia, x-ray and laboratory work depends entirely upon the activity of the hospital and the degree of service rendered in the x-ray and laboratory departments.

In any combination arrangement it must be remembered that the anesthetist's first responsibility is anesthesia and that she therefore must be free to go immediately to the surgery when her services are required. Any arrangement of work should be clearly understood by the anesthetist and the hospital superintendent before the position is accepted.

In this connection also, there is less chance for misunderstanding and a greater possibility of obtaining the services of a competent anesthetist, if the anesthetist is given the rating of a department head in the institution and if she is assigned to work directly under the Superintendent of the hospital; in other words, the problems incidental to the anesthetist's position in the institution should be referred to the hospital superintendent by the anesthetist, and not through any other department in the institution.

SOME IMPRESSIONS ON ANESTHESIA FROM THE VIEWPOINT OF AN INTERNIST

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The field of anesthesia has become so broadened with the advent of the newer anesthetics that it is almost impossible to evaluate these properly from the viewpoint of an internist. My remarks will be confined to ether and nitrous

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oxide-oxygen anesthesia, since my observations on other anesthetics are wholly inadequate to pass an opinion.

The safety of anesthesia means whole-hearted cooperation among the family physician, surgeon, internist, nurse, and anesthetist. The proper preparation of the patient is most important, except, perhaps in real emergency. Many patients, women especially, who are about to have an operation for a chronic ailment are prone to come into the hospital greatly fatigued from their labors at home. Sufficient rest should be allowed, since fatigue products are detrimental. The kind of disease will regulate the time of hospital preparation.

First: Most *chronic infections*, such as gallbladder disease, lung abscess, kidney stone with infection, prostate, all require careful study, especially of heart, blood and urine. For many of them proper digitalization and elimination of upper respiratory infection, of course, make anesthesia easier. Surgery of the upper abdomen tends to lessen the diaphragmatic action and so lessen expansion of the lung bases. If there is no contraindication, deep breathing before operation, especially in the short, broad-chested type will be an aid in avoidance of postoperative respiratory complications.

Secondly: Depleting diseases, as cancer, toxic goiter, tuberculosis and uterine fibroids demand special attention. Transfusion, by increasing the oxygen-carrying power of the blood, aids anesthesia. Lugol's solution reduces thyroid toxicity. This means lessened tendency to acidosis and slower and more regular pulse. Recently vitamin B has been shown to aid cardiac muscle and in diseases with a great loss of weight is of distinct help in stimulating the appetite.

Nervous factors in the preparation of the patient are to be considered, but the proper physical preparation of the patient should not be slighted because the patient herself is in a hurry for the operation. The toxic goiter patient is especially apprehensive and must often be reassured about the safety of the anesthetic and the operation, et cetera. Many surgeons by the use of preliminary barbiturates seek to produce sleep deep enough to permit transportation of the patient to the operating room so that she is wholly oblivious to her surroundings. Others, including ourselves, have felt that less deep preliminary medication may be used if the operation is done in the patient's room. In our judgment, this is the safer procedure.

Even patients for tonsillectomy should have special preparation if a general anesthetic is used. In addition to the usual procedure, some nose and throat men are giving iodine in some form for several days prior to the tonsil operation. The basis for this was from some of the work in our clinic on goiter cases. Many such cases have a reduced number of leucocytes and an increased number of lymphocytes. As you know, in this locality particularly there may be a distinct tendency to a lymphoid state in children in the way of enlarged tonsils, lymph glands and adenoids. Often accompanying this there may be increased size of the thymus. While we appreciate that so-called status lymphaticus may be a rare condition, sudden deaths at the beginning of anesthesia have occurred in patients brought for tonsillectomy.

In our work with goiter patients we found that Lugol's solution increased the number of leucocytes and decreased the relative number of lymphocytes. It has always been Dr. Crotti's custom to explore the thymus

area at the time of a goiter operation and if any tissue were present to remove it. Prior to the use of Lugol's solution the percentage of persistent thymus found was about 20, while the number of cases investigated following the use of Lugol's solution showed at operation a persistence of thymus of only 2 per cent. In children, if a blood count is taken, many times the leucocytes will be reduced and the lymphocytes markedly increased. This increased lymphocytosis may be an index to the general lymphoid state. If iodine changes this, it is our judgment that the patient is a safer risk for anesthesia.

Since the heart is such an important factor in anesthesia, the study of measures to learn the efficiency of this organ has been very keen in recent years. We have not as yet developed an infallible test. The determination of heart efficiency is greatly desirable in all cases over 40 years of age, especially in chronic diseases. Needless to say, these tests should be used in all cases where there is any cardiac disturbance. Various cardiac efficiency tests depend upon the blood pressure changes. Neuhof in his book, "The Heart," summarizes the objections to these efficiency tests as follows:[1] 1. Blood pressure depends upon other factors than the heart itself. 2. Cardiac rate is increased often out of proportion to the pulse present. 3. Increased cardiac work does not necessarily imply increased systolic output or increased blood pressure. 4. The state of venous congestion in the splanchnic area may influence calculation.

1st. *The Stange Breath Holding Test.* Our observations on this test have been made over several hundred cases and we feel that it is a simple and fairly efficient one. The technique used is first to have the patient breathe quietly for a few minutes. He then takes one-half a complete inspiration and holds it as long as possible. A patient with good cardiac efficiency can hold the breath for twenty-five to fifty seconds, while under twenty seconds is considered poor. The chief objection to this test is the possible psychic factor, especially in nervous cases, and if there is a relative acidosis it is without value.

2nd. *Vital Capacity.* This is taken by an instrument known as a *spirometer.* The technique is as follows: The patient sits or lies quietly for a short period of time and then takes a deep breath and exhales all possible into the machine. The measurement is in liters. The normal reading is dependent on the sex, weight and height. The lung capacity serves as an index to the cardiac efficiency. It is interesting to note that the vital capacity is definitely decreased in most cases where the patient changes from the sitting to the prone position and still more decreased in the Trendelenburg position. Patients with decompensation may be compelled to sit erect or sometimes recline in order to breathe.

3rd. *The* use of the *electrocardiograph* may be necessary to give an index to the efficiency of the heart muscle or the state of the coronary vessels.

4th. An instrument known as the *Cameron Heartometer,* which determines the blood pressure by special Neon and Argon lights and also describes a graph of the brachial pulse, may add further valuable information.

5th. For a number of years we have used a simple cardiac efficiency test which depends upon the change in heart size. The stethoscope is placed in the 4th interspace just outside the left sternal margin and a light percussion employed on the chest wall from the left toward the heart and from the

right toward the heart. The sound comes forcibly into the ears when the border is reached. In this way the borders of the heart dullness and not the outline of the heart itself are determined as an index to the size of the heart. The technique of the test is as follows: The right border of the heart is determined as already described, with the patient in a prone position in bed, and grasping the hand of the examiner, the patient elevates himself to a sitting position ten times. The right border of the heart is again percussed in the prone position. If this border has moved to the right appreciably, then we feel that the cardiac efficiency is less than normal. By this method of percussion the right border of cardiac dullness in the normal adult is found at the left sternal margin or midsternum. Any distinct dilatation of the heart to the right will mean the right border to the right of the sternum in the 4th interspace. A verification of this border is easily made by percussing from above downward along the sternal margin, since in the second and usually the third interspace no dullness is revealed. We have stressed these points in some detail since our study of the heart behavior under various percentages of nitrous oxide and oxygen was made in this manner.

Acute Cardiac Dilatation. While the term "acute cardiac dilatation" as a cause of death is acceptable in standard tables, many have questioned its occurrence. They cite the absence of autopsy proof. We have thought that some deaths may be due to this cause, and that autopsy was not performed soon enough after death to determine the dilatation. *Hewlett* on this subject says,[2] that temporary moderate dilatation may aid muscular contraction but "excessive dilatation lessens the contractile force of the muscle and changes that characterize acute cardiac dilatation supervene. The dilated ventricle fails to expel the blood coming to it. The venous pressure rises and this in turn tends to distend the ventricular cavity still further during diastole. If, however, demands are not reduced below the functional capacity of the weakened muscle the continuous collection of blood in the dilated ventricle leads to cardiac death."

Cheyne-Stokes Respiration. We have not witnessed a sudden death attributed to nitrous oxide-oxygen anesthesia but from the literature and interviews with other men such accidents usually occur in the first few seconds or minutes of anesthesia. For a long time I have wondered if some of the accidents might not be attributed to the method of supplying pure nitrous oxide to the patient and then as cyanosis appears reducing it with oxygen. It has seemed to us a sudden anoxemia could so overburden a heart which might or might not have been previously diseased, that dilatation could take place. Could not this sudden anoxemia be similar to the period of apnea in Cheyne-Stokes respiration? The number of observations on patients with this condition has been few. We have discovered that the heart may dilate to the right in the period of apnea and the blood pressure fall simultaneously. During hyperpnea, when there is relief from the anoxemia of the apnea period the heart returns to normal and the blood pressure rises.

The effects of nitrous oxide with a minimum use of ether have been studied over a period of years in our clinic. I make no personal claim to the title of anesthetist but give you my observations as an internist. About thirteen years ago we began to consider the effect of nitrous oxide admin-

istration upon the heart. These studies were made on goiter patients in whom there is very often serious cardiac disturbance. The patients were not informed of the approaching operation. I personally placed the mask over the face, the eyes previously covered. The patient was told another test was to be given. The anesthetist then entered with his apparatus. At first, pure nitrous oxide was started and in a large number of cases the heart would dilate to the right. We then tried a 50-50 mixture of nitrous oxide and oxygen and there was less tendency to dilate to the right. We finally began to use pure oxygen and gradually introduced nitrous oxide. After this there was rarely dilatation to the right and if it did occur and persisted the operation was cancelled for that day and further preparation given to the patient. Ages of the patients were from seven to seventy-eight years.

Many patients with auricular fibrillation in whom the heart has not reverted to normal rhythm, have been operated upon without postoperative catastrophe. When fibrillation of a moderate degree exists without dilatation to the right under the method just described, the patient is considered a safe risk. This is provided, of course, that all other deciding factors have been previously considered when the patient is scheduled for surgery. The general behavior of the patient and whether or not the apex rate is rising too high just before the incision are other factors considered.

Postoperative respiratory complications have been rare in thyroid operations. We believe this condition may be attributed in part to the preoperative preparation and the fact that the patients do not leave their own room. There has been only one pneumonia after operation in the past five years and this proved to be a lobar type 8. Massive collapse of the lung occurred in one abdominal case following gas-ether anesthesia. This was not fatal and it was the only respiratory complication in the last five years in a large series of abdominal cases and breast operations. Most of these were performed under ether anesthesia.

The mortality in 6,000 thyroidectomies in all degrees of severity, using the method just described, was less than 1 per cent.

Summary:

1. Anesthesia can be made increasingly safe in proportion to the proper preparation of the patient.
2. Methods of determining cardiac efficiency are described.
3. A method is proposed for safeguarding thyroid patients which has been employed in 6,000 operations with a mortality of less than 1 per cent.

References.

[1] Neuhof: The Heart. Blakiston's Sons and Company, Philadelphia.

[2] Hewlett: Pathological Physiology of Internal Diseases. Appleton, 15-19, 1924.

WHAT THE NURSE ANESTHETIST SHOULD KNOW ABOUT SPINAL ANESTHESIA

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The use of cocaine to block the spinal roots was first suggested in 1885 by a neurologist named Corning. Later, Quincke, who introduced the method of spinal puncture, prepared the way for the introduction of an anesthetic drug into the subarachnoid space. In 1898, Bier, a German surgeon, first reported the use of spinal anesthesia, in six cases. Since that time this method of producing anesthesia has gradually gained in favor as the technique of its use and its control have become better known. At the present time the use of spinal anesthesia has become so widely accepted and its advantages so broadly recognized that many surgeons recommend it for the majority of operations on the lower extremities and lower abdomen. It has become a necessity, therefore, for the nurse anesthetist to familiarize herself with the mode of action of the spinal anesthetic drugs, with the complications that may develop with their use and with the various methods which may be used to avoid and to counteract these complications.

Action of Spinal Anesthetics

When an anesthetic drug in solution is introduced into the subarachnoid space, the drug acts upon the nerve roots as they leave the spinal cord. Three groups of nerves are found in these nerve roots: the motor nerves which innervate the muscles, the sensory nerves which carry pain, temperature and other impulses to the brain, and the sympathetic nerves which have to do with the control of circulation by their action upon the heart and blood vessels. These nerves are affected differently because of the fact that the nerve fiber is covered with insulation—myelinated sheaths, of different thicknesses. It is easy to understand, therefore, that the nerves which have the thinnest sheath would be affected first and by a smaller concentration of the drug, whereas the nerves with the thickest myelinated sheath would be affected last and only by a greater concentration of the drug. The sensory and the vasomotor nerves have relatively thin sheaths; therefore, when the spinal anesthetic is introduced we find a sensory and sympathetic nerve paralysis which precedes and extends higher along the spinal cord than does the motor paralysis. In the same way we often note, after fixation of the anesthetic, an anesthesia which is two or three cord segments above the site of the muscular relaxation.

Effects of the Spinal Anesthesia

When the spinal anesthetic blocks motor nerves the effect is to produce a flaccid paralysis of all the muscles innervated by the blocked nerve. This action is extremely advantageous because it produces absolute relaxation,

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an ideal condition for surgical procedures. In only one respect is this action a disadvantage. As the anesthetic ascends in the subarachnoid space into the thoracic cord, there is a paralysis of the intercostal muscles, which may be a factor in reducing the respiratory excursion and gaseous exchange. This action usually is not dangerous unless the anesthetic reaches the level of the cervical cord in high enough concentration to block the phrenic nerve, causing a paralysis of the diaphragm. Nevertheless, because of the effect on the intercostal muscles and therefore upon respiration, it is often wise to administer oxygen in high spinal anesthesias.

The effect on the sensory nerves is to produce a sensory block—an anesthesia in the entire area from which the blocked sensory nerves arise. This makes for rapid, painless operating and is an advantage without any disadvantage.

The block of sympathetic nerves begins when the anesthetic solution rises in the subarachnoid space to the level of the third cord segment. Since there are no sympathetic fibers leaving the cord below this level, an anesthetic which is confined to the lower segments of the cord (roughly, anesthesia of the perineum and leg, toes to the knee), has no effect on the sympathetic nerves and therefore no fall in blood pressure may be expected. As the anesthetic ascends along the cord an increasing number of sympathetic fibers are blocked, resulting in an increasing fall of the blood pressure because the sympathetic fibers are those which maintain the tone of the blood vessels. In the upper thoracic cord the sympathetic fibers pass also to the heart where they stimulate the rate of the heart beat. When these cardiac fibers are blocked by the anesthetic the heart beat becomes slower because it is now under the control of the vagus nerve only. It is possible to counteract the effect of block of the sympathetic nerves in the subarachnoid space by the action of a drug which stimulates the nerves at their endings. Such drugs are adrenalin, neosynephrin and ephedrine. If given before the anesthetic is introduced, they produce a peripheral vasoconstriction which counteracts the effect of the central block of the nerve. Ephedrine is usually given because its effects are of longer duration. On the other hand, the more rapid action of adrenalin or neosynephrin makes them more useful drugs when immediate increase in blood pressure is desired.

Control of the Level of Spinal Anesthesia

The level of anesthesia produced by the injection of anesthetic drugs can now be controlled in a fairly reliable fashion. The methods of control may be itemized as follows:

Site of puncture. This method of controlling the level of the anesthesia is not used very frequently because it is somewhat dangerous to introduce the needle into the subarachnoid space above the level of the first lumbar vertebra. Above this area the cord almost fills the dural sac. It stops at this level and below it lie the spinal roots, which are not easily injured by the puncture needle. Therefore most of the spinal punctures are made in the third or fourth lumbar interspace.

Volumetric control. Although it is no longer thought to be good practice to draw off large quantities of spinal fluid, to dissolve the anesthetic drug in this fluid and then to reinject this solution, there is in a general way a relation between the height of the anesthesia and the amount of solution in-

jected. The solution of the anesthetic drug mixes with about an equal quantity of spinal fluid during the injection so that for a high anesthetic a larger amount of solution should be used and a relatively smaller amount when it is desired to confine the anesthesia to the lower extremities or perineum.

Gravity control. The solution of a spinal anesthetic drug may be heavier than spinal fluid—hyperbarbic, of the same specific gravity as the spinal fluid—isobarbic, or lighter than spinal fluid—hypobarbic. The height of the anesthesia may be controlled fairly well by varying the patient's position when the anesthetic solution is of a different specific gravity than that of the spinal fluid. If the solution is heavier than spinal fluid, such as solutions of novocaine dissolved in spinal fluid, it may be made to ascend around the cord by lowering the patient's head and, in the same way, its ascent may be stopped by raising the head. When an anesthetic solution lighter than spinal fluid is used, such as spinocaine, it is made to ascend by elevation of the head and can be stopped by lowering the head. When the solution is isobarbic, as for instance the solution of pantocain, the level of anesthesia cannot be controlled so well by changing the patient's position. In order to take advantage of slight differences in specific gravity to control the level of the anesthesia, the solution of the drug must be injected slowly. It is important for the anesthetist to know which type of solution has been injected so that she may obtain the desired height of anesthesia by proper tilting of the table.

Fixation of the Anesthetic Drug

When the anesthetic drug is introduced into the subarachnoid space, it becomes fixed in the nerve tissue which it bathes. The concentration of the drug is greatest at the site of the injection in the lower dural sac and gradually becomes less as the solution ascends around the spinal cord. The anesthetic action in the upper levels of the spinal cord is thus shorter than in the lower levels, because the amount of the drug acting on the nerves is less. The fixation of the drug becomes complete within ten or fifteen minutes after its injection into the subarachnoid space, varying with the concentration of the drug originally injected. The change in the patient's position to carry the drug upward along the spinal cord must, therefore, be made almost at once because if it is delayed, so much of the drug will have become fixed that the concentration in the upper levels of the cord will be insufficient to produce anesthesia.

Control of Duration of Spinal Anesthesia

The duration of spinal anesthesia may be as long as desired for the performance of practically any operation below the diaphragm. It may be controlled according to the needs of the operation by varying the amount of anesthetic drug injected or by the choice of the drugs used. For operations which take up to an hour novocaine may be used in amounts up to about 200 milligrams, depending upon the site of the operation. In operations which are expected to last longer than an hour but less than two hours, a solution of metycaine is available. For those lasting up to two and one-half hours there is pantocain and for longer operations nupercaine. With this array of anesthetic drugs the criticism that the spinal anesthesias do not last long enough to permit completion of the operation has no longer any weight.

Duties of the Nurse Anesthetist

The duties of the nurse anesthetist begin with the arrival of the patient in the anesthetizing room. One of her first duties is to allay the fears of the patient. An air of confidence and assurance will do much toward making the patient feel less apprehensive and anxious about his operation. The blood pressure cuff must be adjusted and the stethoscope placed upon the arm on the side of the operator. This side is chosen because it is more convenient to introduce intravenous infusions into the arm on the side away from the surgeon. The nurse should then make an estimation of blood pressure, which is told to the physician who is to introduce the anesthetic drug. The patient is placed in position for lumbar puncture. As a rule, the lateral position is used and, since hyperbarbic solutions are more commonly employed, the patient is usually placed on the side on which the operation is to be performed. Thus if the operation is to be an appendectomy or a cholecystectomy the patient is placed on the right side. The purpose of this position when using hyperbarbic solutions is to permit a higher concentration of the drug on the side on which the operation is to be performed. It is possible in a few cases to obtain unilateral anesthesia by this procedure. After the anesthetic drug has been injected the patient is usually placed on his back and the position of the table changed according to the type of operation to be performed. If a hyperbarbic solution is used and the operation to be performed is on the perineum, the head is raised so as to confine the drug to the lower part of the dural sac. If the operation is to be upon the upper abdomen the table is tilted so that the head is lowered about twenty degrees from the horizontal. The anesthetist must then watch the level of anesthesia by testing the patient with some sharp instrument. A towel clip has been found excellent for this purpose. When the anesthesia has reached the desired level the position is maintained for two or three minutes and then the table is raised to the horizontal so as to stop further ascent of the drug. The anesthetist should be familiar enough with the working of the operating table to make these adjustments rapidly. Throughout the duration of the anesthesia observations of the blood pressure are made at five minute intervals and the surgeon in charge should be warned of any fall. A fall of blood pressure below one hundred may suggest to the surgeon the necessity for giving vasoconstrictor drugs such as adrenalin or ephedrine. These should be within easy reach of the anesthetist, in case the need for them arises. It is the practice of some surgeons who use spinal anesthesia for operations on the upper abdomen to give an intravenous infusion as soon as the patient is brought into the operating room. In such cases it is usually the duty of the anesthetist to watch the infusion setup and see that fluid is added as needed.

In a relatively small percentage of cases, most often when the operation is on the upper abdomen, vomiting may occur during the spinal anesthesia. In such cases the duties of the anesthetist are evident. When the patient has been cleaned up after vomiting, or better, with the first few retchings, oxygen should be given in about 95 per cent concentration. This is almost a specific for this complication and its action is practically immediate. Oxygen is also given, as was previously mentioned, in cases of high anesthesia where there is some respiratory depression. On the rare occasion when

the anesthetic reaches the cervical cord in strong enough concentration to block the phrenic nerves, respiratory paralysis occurs until the phrenic block wears off. In such cases artificial respiration, oxygen under tension through an endotracheal catheter, or the Drinker respirator must be employed until normal breathing returns. This complication is probably the most serious of those which may occur with spinal anesthesia, and it should not appear if the patient is properly watched and the level of anesthesia tested at frequent intervals.

Finally, the anesthetist may be called upon to give a supplementary anesthesia if the spinal anesthetic has failed to produce anesthesia or in those cases in which the duration of the spinal anesthesia has been insufficient to complete the operation. The administration of an anesthetic under these conditions is often a severe test of the anesthetist's skill. It is usually wise to request that all operative manipulations be stopped for a time so that the anesthetic may be given with the least possible disturbance to the patient. The failure to make this request usually results in a prolonged and difficult induction with consequent danger to the patient and to the blood pressure of the surgeon. As a rule, the anesthetist need have no fear about the patient's blood pressure if there is no longer anesthesia in the operative field, and her entire attention may be directed to the administration of the inhalation anesthetic, until the desired plane of the third stage has been reached. Cyclopropane or nitrous oxide—oxygen and ether are the anesthetics best adapted for use in this situation.

In summary, the nurse anesthetist has numerous specific and important duties to perform in cases in which spinal anesthesia is used. She must by her actions and words instill confidence and divert the attention of the patient from the operation. She must adjust the blood pressure cuff and stethoscope, and make frequent observations of blood pressure before and during the anesthesia. She must see that the patient is in position for lumbar puncture and adjust the table to permit the ascent of the anesthesia to the desired level and to stop its ascent when it has reached that level. This requires frequent testing of the level of the anesthesia, especially during the first few minutes after the solution has been injected. She must be prepared to administer vasoconstrictor drugs, to watch the administration of intravenous solutions and to administer oxygen when vomiting or respiratory depression appears. Finally, she must be prepared to supplement the spinal anesthesia should its effects or duration be insufficient for the operation at hand.

It is just as important to have an intelligent, experienced and skillful anesthetist at the head of the operating table when a spinal anesthetic is being used as when the operation is performed under general anesthesia. Although the nurse anesthetist may not give the anesthetic, she is just as useful and necessary to the operating team as if she were dropping ether. An indifferent and careless anesthetist may permit complications to develop which would not occur with constant and accurate observations of the anesthetic effects. On the other hand a cheerful and efficient nurse anesthetist can make an operation under spinal anesthesia a pleasure not only to the surgeon, but to the patient.

EARLY RECOGNITION OF SHOCK

CATHERINE CAMERON*

St. Joseph's Hospital, Milwaukee, Wis.

Definition of Shock:

Shock may be defined as an injury or devitalization of the brain produced by various forms of trauma and characterized by pallor, drop in blood pressure and rapid, thready pulse.

Description of Mechanism of Shock:

It is one thing to say that shock is a severe injury to the brain and spinal cord and another to describe just what reaction occurs in the body to produce the picture of shock. To the best of our knowledge, shock results because the large veins of the abdominal cavity dilate and the blood accumulates in these large veins, which are, therefore, for all practical purposes, pools of stagnant blood. Because of this accumulation of stagnant blood in the veins, relatively little blood returns to the heart and as a consequence the heart must beat faster because it is pumping the smaller amount of blood to the vital organs, which demand a certain minimum amount of blood for normal function.

Because the amount of blood which the heart pumps into the arteries is markedly diminished the blood pressure drops, although the pulse or number of heart beats increase. The fact that the blood is accumulated in the large veins and does not circulate in proper amounts through the surface arteries accounts for the pallor.

Respiration in Shock:

Respiration in shock may be rapid in the early stages, but as this condition advances the respiration becomes slow and irregular and the inspiration is shorter than the expiration, the character of the latter suggesting definite fatigue or exhaustion of the respiratory center. There is extreme pallor, cold and often pulseless extremities. We can thus see the mechanism involved in the production of the cardinal symptoms of shock: namely, rapid, thready pulse, drop in blood pressure, pallor and disturbed respiration.

The injuries which produce shock are manifold. Shock can be produced by severe blows on the head, skull fracture, fracture of the femur, massive hemorrhage and by certain drugs. Most important of all causes of shock, in so far as the anesthetist is concerned, are anesthesia and surgical procedures. In view of the fact that we now know that the psychic effect of fear and apprehension is conducive to shock, it behooves every anesthetist to eliminate these factors as much as is humanly possible.

Shock in its most severe form is accompanied by rapid pulse, drop in blood pressure, and pallor, but we must realize that shock occurs in varying degrees: namely, mild, moderate or severe, and that the symptoms and findings must therefore vary in degree. By this I mean that in mild or first-degree shock there may be only a 20 per cent increase in the pulse rate and no decrease in the blood pressure. We must never forget, however, that certain anesthetic agents, particularly cyclopropane and frequently ethylene, alter the traditional symptoms of shock. Because of this fact, we may see a 10

* Read at the annual meeting of the Minnesota Association of Nurse Anesthetists, held in Minneapolis, Minn., May 20, 1938.

per cent decrease in blood pressure, but no increase in pulse rate, in spite of the presence of shock when the patient is under the effect of either of these anesthetics.

In moderate or second-degree shock both the drop in blood pressure and marked increase in pulse rate appear. The blood pressure drops 25 per cent and the pulse increases 20 to 30 per cent.

In advanced or third-degree shock the systolic pressure will be 80 mm. or less, and the diastolic 50 mm., with a pulse pressure of 30 mm. or less, the pulse rate 130 or over. An exception to this pulse rate will be noted in cyclopropane, where there may be a severe drop in blood pressure accompanied by an abnormally slow pulse. This discrepancy in the pulse rate of a patient in shock may also be seen in ethylene but is less pronounced.

It is the duty of the alert anesthetist to know and recognize the *early* symptoms of shock rather than to discount the early evidence and wait for the picture of severe and profound shock to develop. Furthermore, it is the responsibility of the anesthetist to know accurately the modifying effects of *all* anesthetic agents and how they may modify the picture of shock. The response to the treatment in mild shock is so satisfactory, compared with the response in severe shock, that early recognition of shock is of paramount importance. If the systolic pressure remains for any length of time at 50 mm. or less, irreparable damage occurs to the brain. When extensive cerebral damage has occurred there is always the strong possibility that *no* treatment will prevent a fatal outcome, therefore, we cannot afford to miss the golden opportunity of recognizing and treating early or *mild* shock.

Blood pressure should be taken routinely in major surgery but it is imperative in cases requiring prolonged deep anesthesia, in poor risks, in all thyroid cases, and in all lengthy or difficult operations. It is a necessary guide where cardiac complications exist, such as hypertensive heart disease, for in these instances the patients are more susceptible to shock.

Asphyxia

It is also important to know that asphyxia may be a contributing cause of shock. While asphyxia may be brought on by faulty position of the patient, obstructed air passages or inadequate oxygen intake, the first alarming signal of asphyxiation will be a marked rise in the blood pressure irrespective of the cause. The marked rise of blood pressure is produced by the action of the vasomotor center and this marked rise in blood pressure may occur before there is appreciable darkening of the blood.

Sources of Shock:

To the anesthetist the following factors are of paramount importance in the causation of shock:

1. Prolonged anesthesia, particularly uneven anesthesia.

2. Obstructed aeration producing asphyxia for any period over twenty minutes.

3. Anoxemia of twenty minutes or longer in anemic patients.

4. Improper type of anesthesia for the particular patient (for instance, persisting in the use of nitrous oxide or ethylene when the individual does not tolerate these gases, and would be more satisfactorily anesthetized with drop ether). In keeping with this idea, with experience we have proved that certain patients on ethylene do better if changed to cyclopropane, while other individuals receiving cyclopropane are improved by a change to ethylene.

Very close check of pulse, blood pressure, respiration, and condition of the skin are the important guides definitely indicating a change from one anesthetic agent to another.

5. *Anesthesia* over 45 minutes in duration in infants up to eight months, operated on for intussusception, and anesthesias over one hour in duration in children from two to eight years of age; anesthesia in senile individuals over 65 years of age.

6. Sudden change of the position of the patient who has been deeply anesthetized for one hour or more, as is sometimes seen in cases where extreme Trendelenberg position has been used and there is a change to the horizontal position.

7. Formidable and prolonged operations; such as, stomach resection, cholecystectomy, and operations for intestinal obstruction, where the patient may be suffering from some degree of shock prior to the operation.

8. Patients who have been subjected to spinal anesthesia and then require supplementary inhalation anesthesia during the manipulative part of the operation. Patients under spinal anesthesia whose position is changed during the operation may also evidence shock.

9. Marked hemorrhage during the course of the anesthesia.

10. Diminished hemoglobin and red cells predispose patients to shock who are subjected to ethylene or nitrous oxide anesthesia, particularly if the hemoglobin is lower than 50 per cent and the red blood cell count is under 3,000,000.

11. Patients who are markedly dehydrated due to loss of fluid from prolonged vomiting previous to surgery.

12. Patients who are generally debilitated as a result of chronic heart, kidney or pulmonary disease.

13. Certain operations involve greater possibilities of shock, such as brain surgery, surgery on the cervical and thoracic vertebrae, treatment of compound fracture of the femur, reconstruction of the hip and radical breast amputation.

14. Overdosage of any anesthetic agent producing a definite decrease in oxygen supply to the brain with resultant injury to the respiratory center and the brain.

Our treatment in brief is as follows:

1. Modification of the anesthetic mixture by increasing the oxygen content and decreasing the anesthetic agent.

2. Trendelenberg position to counteract anemia of the brain.

3. Coramine 1.5 cc. intramuscularly; in children of all ages ½ cc. may be administered.

4. If no response is apparent in ten minutes after the administration of coramine, 1 ampule of metrazol is given intramuscularly. Metrazol appears to be particularly effective in shock due to the depression of respiration with ether or avertin.

5. If no recuperative effect is noticed within thirty minutes after the coramine is given, 500 to 1000 cc. of intravenous glucose 5 to 10 per cent in normal saline is administered.

6. During administration of the intravenous glucose, external heat in the form of hot water bags is applied to the body.

7. If 200 to 400 cc. of intravenous glucose has not produced definite improvement, 500 cc. of a 6 per cent solution of acacia is given intravenously and the patient is typed for blood transfusion.

I realize that recently there has been a question as to the ill effects resulting from acacia. In answer to this question, I can only state that our

medical consultant has seen no ill effects, immediate or remote, from a single administration of acacia and that it would appear worth taking a slight risk, if there is a possibility of the patient's life being saved by using acacia, which often appears to be life-saving in its effect.

8. Transfusion as soon as possible following acacia administration.

9. The patient should be kept in the operating room until definite response to treatment is noted, because in the operating room the facilities for concerted treatment are available.

10. The bed with warm blankets should be brought to the operating room to avoid moving the patient unnecessarily.

11. The patient should be carefully observed after being put to bed for recurrence of shock. This observation should include hourly blood pressure readings for the first six hours after operation. If evidence of shock recurs, the foregoing treatment may be repeated.

In conclusion, I would reiterate that early recognition of shock is the secret of avoiding fatalities from this cause, for in shock "an ounce of prevention is worth more than a pound of cure."

THE EFFECTS OF ANESTHETICS ON THE HEART

CHARLES J. BETLACH, M.D., M.S.*

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The patient who has heart disease does not constitute a normal risk for surgery. Therefore we try to choose the anesthetic agent which is most suitable for the operation to be performed and which, at the same time, will put the least strain on the heart. We should know, then, how each anesthetic agent will affect the heart.

In order to understand the effects of anesthetics on the heart, it is necessary to review some of its physiology. The auricles are two chambers that receive blood from the veins and act as a storage place for the blood until the ventricles can receive this blood and pump it on through the pulmonary and peripheral circulations. The auricles are thin-walled cavities, whereas the ventricles are composed of thick muscles because of the enormous amount of work they have to do. If the auricles become diseased or their rhythm becomes irregular without changing the rhythm of the ventricles, the efficiency of the heart remains good. However, if the ventricles become diseased or their rhythm becomes irregular, the efficiency of the heart is greatly reduced. That is why ventricular fibrillation is practically always fatal, whereas auricular fibrillation, of itself, is not fatal. Among warm-blooded animals, the heart is capable, under proper conditions, of continuing its rhythmic contractions for many hours after it has been removed from the body. This shows that the heart beat is an inherent property of the cardiac muscle and is the reason that the heart is the last organ in the body that ceases to function.

There is a special conducting system in the heart which initiates and prop-

* Read at the meeting of the Minnesota Nurse Anesthetists' Association, Minneapolis, Minnesota, May 20, 1938.

agates the stimulus for cardiac contraction. This system is formed of specialized muscle fibers and has its origin in the sino-auricular node in the right auricle. There is also the auriculoventricular node which is situated at the junction of the auricles and ventricles and leads into a group of fibers called the bundle of His. The bundle of His divides into two smaller bundles, each distributed to a corresponding ventricle. The sino-auricular node is the starting point of the wave of excitation or contraction concerned in each heart beat. It is therefore spoken of as the "pacemaker" of the heart. The wave of excitation passes over the auricles and arrives at the auriculoventricular node. From there the impulse is carried on to the ventricles along the bundle of His, which branches out toward all parts of the ventricles. Normally this system initiates each heart beat, causing the auricles to beat or contract first, then the ventricles. However, disease may affect this system and parts of it may cease to function. The heart will continue to beat in spite of this because of the inherent rhythmic qualities of the muscle.

Auricular fibrillation is an example of this inherent characteristic. The auricles, instead of beating 70 to 80 times per minute, beat about 180 times per minute. The ventricles are irregularly stimulated by these weak impulses coming from the auricles and therefore they do not beat regularly and their efficiency is greatly reduced. If fibrillation of the ventricles occurs, the result is practically always death because the ventricles are not forcing any blood into the large vessels. This is a condition incompatible with life.

The physiologic activities of cardiac muscle may be recorded by the electrocardiograph. This procedure allows the detection of many irregularities and changes which cannot be diagnosed by feeling the pulse or by auscultation of the heart and has provided an opportunity to study the action of the heart during the administration of various anesthetics.

A diseased heart may be more irritable than a normal heart and when some foreign substance such as an anesthetic is introduced into the blood stream it may make the heart still more irritable. When a patient is excited and apprehensive as is often the case before operation, production of adrenalin within the body is increased. This substance, of itself, is a cardiac stimulant; thus, the situation is one in which we should be on the lookout for sudden cardiac collapse.

I shall present the facts that are known concerning the action on the heart of the most common anesthetic agents. Each individual may form his own opinion on the basis of these facts.

Chloroform has long been known to be a dangerous anesthetic as far as the heart is concerned. In 1914 it was demonstrated to cause ventricular fibrillation in cats. Since that time, many observations have been made concerning the toxic effect of chloroform on the heart of human beings. This has been one of the chief reasons why chloroform has decreased in popularity. Chloroform very definitely sensitizes cardiac muscle to adrenalin, consequently the administration of adrenalin is contraindicated during chloroform anesthesia. The amount of blood pumped by the heart, that is, its cardiac output, is decreased 28 per cent during chloroform anesthesia.

Nitrous oxide itself has very little effect on the heart but its administration as the sole anesthetic is often accompanied by cyanosis and therein lies the danger. When the concentration

of oxygen in the blood decreases to 50 per cent electrocardiographic examination gives evidence of a change in cardiac function. A greater decrease of concentration of oxygen causes further electrocardiographic changes and still further decrease may cause heart block and fibrillation.

Ethylene is apparently similar to nitrous oxide in regard to cardiac changes but probably it is safer because of the higher percentage of oxygen used during its administration.

Cyclopropane is still a relatively new anesthetic and I feel that more work is necessary before a final judgment can be made. However, some very fine work has been done on cyclopropane as related to cardiology. In 1934, in a study on dogs, it was shown that, at the time of respiratory arrest or after, definite changes occur in the heart. However, when artificial respiration was instituted, the rhythm returned to normal and the concentration of cyclopropane could be increased to 60 per cent without any recurrence of cardiac irregularity. This shows that the heart of the dog is not adversely affected until the concentration of cyclopropane has been so increased that respiration ceases or is so diminished that a state of severe anoxemia exists, although the anesthetic mixture in the bag contains adequate oxygen.

In a short series of cases studied during cyclopropane anesthesia, 82 per cent of the patients exhibited some type of arrhythmia; however, only 10 per cent of these were of a serious nature. They consisted of brief periods of multiple extra beats of the ventricles, a condition which decreases the efficiency of the heart and may be followed by ventricular fibrillation. This condition usually can be detected by noting an irregular pulse both as to time and force, and when it occurs during an operation, especially if the pulse has been regular previously, it should be regarded as a sign of danger.

In a more recent study on animals, it has been shown that cyclopropane, as judged by standard injections of adrenalin, has a more definite stimulating or sensitizing effect on the heart than either chloroform or ether. Chloroform is second and ether third. This does not mean that cyclopropane is a particularly dangerous anesthetic agent but it does mean that great attention must be given to the pulse, and adrenalin should not be injected during cyclopropane anesthesia.

Another investigator has found that during stage 3, plane 3 anesthesia with cyclopropane in dogs, the cardiac output is increased 45 per cent. This is in definite contrast to choloroform. Regarding cyclopropane, therefore, we must say that the fundamental data at the present time are not abundant enough to justify the attempt to determine the exact value of cyclopropane as an anesthetic agent.

Ether has undoubtedly had the greatest trial of any known anesthetic agent and when administered properly has been found to be a safe agent in the presence of heart disease. In numerous studies on animals, ether has been found to cause only minor cardiac changes as demonstrated by the electrocardiogram. When adrenalin is injected into etherized animals it does not have the same stimulating action on the heart that it has when animals are under cyclopropane or chloroform anesthesia. It even seems to have a protective action on the heart. In moderate surgical anesthesia with ether, the cardiac output is increased 76 per cent but with very deep ether anesthesia the cardiac output is less than

normal. However, the above favorable facts do not make ether the ideal anesthetic agent for all patients who have cardiac disease.

The two intravenous anesthetics, pentothal sodium and evipal, have little effect on the heart unless respiration is depressed to the point where there is no respiratory exchange. Irregularities may then occur but will disappear as soon as respirations are resumed.

Local anesthesia with procaine has practically no effect on the heart and should be used whenever possible for patients who have cardiac disease.

Anesthetists, who constantly bear the responsibility for human life, should attempt to attain the highest degree of proficiency in order to justify the faith and confidence so willingly bestowed by the patient and his relatives. To possess average ability in one's vocation is not sufficient to justify the acceptance of such faith and confidence. Any individual who is practicing in any branch of medicine should never allow himself to reach that stage wherein he can be content with his accomplishments or proficiency. When an individual ceases to increase his knowledge and to improve his ability to perform his duties, he does not stand still — he regresses, because the rest of the world progresses and soon leaves him far behind. The individual who becomes imbued with the idea of his perfection is one not to be trusted, for there is no such status as perfection.

In conclusion, it may justly be said that solving the problem of anesthesia for patients who have heart disease rests not so much on finding the ideal anesthetic as on developing the ideal anesthetist.

CONVULSIONS IN ETHER ANESTHESIA

SALLIE KNIGHT*

Baylor University Hospital, Dallas, Texas

In 1880 Humphrey first noted muscular activity of a trembling yet rhythmic type occurring during the administration of ether by inhalation. During the years of the World War this manifestation was reported by several observers. The condition is known as "ether clonus" or "ether rigor"; it usually occurs in the course of the induction of anesthesia; the tremor frequently is limited to the limbs and ceases as anesthesia deepens.

In 1916 Mytinger reported his experience in anesthetizing 100 patients suffering from idiopathic epilepsy. Epileptiform convulsions occurred frequently in the stage of induction of anesthesia. In 1922 Patch reported two cases in which epileptiform convulsions occurred in the course of anesthesia, in only one of which was epilepsy known to be a factor—both patients recovered. It is in this group of individuals who do not have epilepsy that we are particularly interested.

Although there is wide diversity of opinion regarding the cause of this complication, there is uniformity in the description of the syndrome. These convulsions occur in their most char-

* Read at the annual meeting of the Texas Nurse Anesthetists' Association, held in Houston, Texas, April 9 and 10, 1938.

acteristic form in young, robust patients with a severe infection; often with ruptured appendix and beginning peritonitis. The patients have marked elevation of temperature, and the instance occurs usually in the hot summer months — very rarely in winter weather. With increased temperature and metabolism these patients are very difficult to relax.

Symptoms:

Respiration is usually rapid and labored, the pupils are widely dilated and the eye is fixed. Frequently the first sign noted is twitching of the muscles of the face occurring during the attempt to reach the maintenance level of anesthesia. The twitching spreads to the muscles of the neck, shoulders and arms and finally to the legs and abdomen. As the twitching spreads it becomes more active, finally violent and sustained. Epileptiform convulsions occur, associated with cyanosis of varying degree. Deepening the anesthesia does not relieve the condition but on the contrary makes it worse. Death may occur while the patient is in the operating room, or later from exhaustion associated with deficient oxygenation. Following cessation of administration of the anesthetic, recovery from anesthesia is delayed and recurrence of convulsions later, when the patient is in bed, has been noted. The patient may die within three to five days after operation.

Factors ascribed as causes of these manifestations are numerous, and ether is the agent that has been most frequently associated with the condition. Naturally, the various methods of administration have been called into question as possible causative factors. All that can be said is that convulsions have followed ether given by all accepted methods, but for some obscure reason the attacks are not known to have followed ether given when used to reinforce the action of a basal anesthetic such as evipal sodium, nembutal or avertin.

Physiological experimentation has shown that the spasm center in the medulla is very sensitive. In these extremely ill patients there are several factors that may affect materially the respiratory center during anesthesia, thereby increasing its sensitivity to such a degree that the convulsions are readily excited reflexly by the pain of the operative trauma, especially that applied to the hypersensitive parietal peritoneum while closing.

Factors that may diminish the normal oxygen supply in the medullary center are fever, with increased metabolism, and extensive muscular rigidity—the latter doubling the consumption of oxygen over the normal. With these patients it is hard for the anesthetist to maintain a normal color and doubtless there is some degree of anoxemia in the medullary center.

To this may be added the toxins of the infection, a greater quantity of which may have been liberated by the operative trauma just previous to the convulsion, combining to produce a hypersensitiveness that even the anesthetist is unable to control. In one of the cases reported, in closing the incision each thrust of the needle caused a convulsion, thus showing clearly that trauma is an initiating factor, and accounting for the usual occurrence of the convulsions when the parietal peritoneum with its sensitive deep reflex connections is being clamped with forceps, pulled together and sutured.

Wilson and others were of the opinion that the convulsions were toxic in origin and that acetaldehyde and peroxide in the ether were the offending agents. Gwathmey disagreed with this opinion and presented some experi-

mental evidence to show that lack of adequate preliminary medication was a factor. Hornbrook took the position that atropine was responsible.

Haworth was inclined to think that toxemia and instability of the nervous system are the most probable causes of the condition. Kemp stated that theoretical and practical treatment of ether convulsions indicates that acapnia or carbon dioxide deficit is the causative factor in many cases.

Case Report—Baylor Hospital

Patient—M.H.—age 4.

On July 12, 1937, at 3:45 p.m., the patient was admitted to the hospital with an acute abdomen, temperature 101.8, pulse 150, respiration 28. History revealed high elevation of temperature accompanied by vomiting for two days previous to admission.

At 4:15 P.M. the patient came to the operating room, and due to unforeseen delay, the anesthesia was not started until 5:10 P.M. Nitrous oxide, ethylene and ether were given. The patient was difficult to relax. The abdomen was opened and a ruptured gangrenous appendix was found.

At 5:35 P.M. twitching of the facial muscles started and the anesthetic was discontinued and oxygen and carbon dioxide given but the patient did not respond. The convulsions spread rapidly over the entire body. Even though the patient had a free air passage, respiration was difficult and cyanosis very marked.

Approximately 3½ grains of sodium amytal was given intravenously until the convulsions were controlled. Following administration of the sodium amytal 450 cc. of normal saline solution was given intravenously. The abdomen was closed hastily. At the cessation of operation temperature by axilla was 105. Colonic irrigation of cool water was started, gradually increasing to the temperature of ice water. At 6:30 P.M. the patient was returned to the ward with a temperature of 101.8 (axilla), pulse 158, respiration 34. At 7:15 P.M. 3½ grains of calcium gluconate was given intramuscularly and the convulsions did not recur. The temperature remained about 101 for three days and there was profuse abdominal drainage. The patient was discharged from the hospital July 19, 1937, and her condition seemed to be good. This child had had no history of convulsions previous to operation.

Drs. Rosenow and Torell of the Mayo Clinic have done some interesting experimental work on convulsions. In two cases in which the patient had acute appendicitis and ether convulsions, lesions of the appendix and ether convulsions were reproduced in the rabbit given injections of streptococci isolated from the patient at the time of the attacks. This condition could not be produced when the streptococci were obtained from the patient after recovery. The symptoms manifested in the course of ether anesthesia, in the animals which received injections, were similar to those noted in cases of ether convulsions that have been reported. Respiration became rapid, jerky and labored and often ceased suddenly, despite great care in the administration of the ether. Resuscitation was always difficult and sometimes impossible.

The specific properties of the streptococci isolated from the throat of patients at the time of the attack, and from the brains of animals which manifested the symptoms and which died, were highly liable. Only freshly isolated strains sufficed to produce highly specific effects.

The results of the experiments suggest that ether convulsions are attri-

butable to a neurotoxin or poison produced by some strain of streptococcus in amounts sufficient to cause spasms in the absence of anesthesia and which in the course of general anesthesia suffice to incite the muscular spasms characteristic of this condition.

Conclusion

Fortunately this serious type of convulsions is exceedingly rare, and hence difficult to study, but as it occurs in such a special type of pathological condition, we may anticipate its development and prevent its occurrence and as usual prevention is far better than cure. If the patient comes to the hospital in midsummer with a diagnosis of acute appendicitis and with high elevation of temperature, rapid respirations, flushed face and apprehensive expression—this is the type of case in which convulsions usually occur and demand special care.

Preventive measures include: first, adequate premedication — morphine in full doses, given early enough to take effect before the anesthetic is started; second, sodium amytal intravenously, given slowly to the induction stage, then inhalation anesthesia, using ethylene, with little or no ether, and sufficient oxygen to maintain a good color.

There are two special features regarding the surgery in these cases that may well be considered, that is, the minimal amount of disturbance of the infected area—thus limiting the liberation and absorption of toxins, and the avoidance as far as possible of trauma in the area of deep reflexes.

Treatment

The administration of the anesthetic must cease at the first sign of facial twitching and a free air way must be maintained. The head should be raised and a carbon dioxide and oxygen mixture should be administered—the hyperpnoea thus produced aids in the elimination of ether. If the convulsions continue, barbiturates should be given intravenously slowly after the first cc. until spasms are controlled.

NEWS ITEM

Effective May 1, 1938, The Ohio Chemical & Manufacturing Company of Cleveland, Ohio, acquired substantially all of the assets of The Heidbrink Company at Minneapolis, a move which has aroused considerable interest among hospitals and the professions.

No material changes are contemplated, and it was learned that the present personnel would be continued. Trade names and trademarks will not be affected. All equipment will be manufactured at the Company's plant at Minneapolis, which will be known hereafter as the Heidbrink Division of The Ohio Chemical & Manufacturing Company. Distribution of both Ohio and Heidbrink products will be through outlets already established.

A CONVENIENT INTRATRACHEAL BALLOON-CATHETER AND MOUTH-PROP

GERTRUDE L. FIFE

University Hospitals of Cleveland

The methods we have used in an effort to prevent the gas from escaping around the intratracheal tube have not seemed to us convenient or entirely satisfactory. We have used the familiar detachable balloon which is inflated with air, after the catheter is inserted, by means of a small tube leading into the balloon and we have also used a packing placed around the tube at the point where the tube enters the trachea.

In our search for a simpler and better method, the idea of the balloon shown in the picture was obtained from a catheter-balloon which was being used in experimental surgery of the heart in the animal laboratory of Dr. Beck. The catheter is the regular silk-woven catheter which can be purchased from companies dealing in intratracheal equipment. The balloon can be obtained at any "dime store," ten for a dime. About one and one-half inches above the end of the catheter, a slit about one-eighth of an inch long is made in the catheter, over which is attached the balloon, which is securely fastened on either end by means of fine black silk.

The patient is put to sleep in the usual manner and the catheter with the balloon attached is inserted by direct method into the trachea. The gas machine is then attached to the end of the catheter by means of the usual adapter. The pressure of the gas delivered to the patient inflates the balloon and keeps it distended to the size of the trachea throughout the operation, thereby preventing the escape of gas around the intratracheal tube. Directly after the gas pressure is withdrawn, the balloon deflates and the tube is easily removed from the trachea.

The mouth-prop seen in the picture is made of wood but would be much better if made of hard rubber. This prop fits securely on the catheter and is placed in position before the tube is inserted into the trachea. We have found it much more satisfactory than any prop we have been able to purchase.

ANNUAL MEETING ALUMNAE ASSOCIATION

UNIVERSITY HOSPITALS SCHOOL OF ANESTHESIA (LAKESIDE) CLEVELAND, OHIO

The annual meeting of the University Hospitals of Cleveland (Lakeside) School of Anesthesia Alumnae Association will be held on Tuesday, September 27, 1938, in Dallas, Texas. Watch the bulletin board for announcement of the hour of the business meeting, at which we would appreciate a good attendance.

A luncheon will be held at 12:00 P.M. on Wednesday, September 28, at the Hilton Hotel. Hilda R. Salomon, Jewish Hospital, Philadelphia, Pa., will be the guest speaker. Miss Mary Vine Allison, Meriden Hospital, Meriden, Conn., will talk on "What My Training at Lakeside Has Meant to Me." Please make reservations early.

Attendance at the annual meeting of the National Association gives the Lakeside graduates an opportunity to follow the progress of the School of Anesthesia and to become active in the development of the future program of the Alumnae Association.

RUTH GRAFF, Secretary
11100 Euclid Avenue
Cleveland, Ohio

ACTIVITIES OF STATE ORGANIZATIONS

INDIANA

The second annual meeting of the Indiana Association of Nurse Anesthetists was held in Indianapolis on May 11, 1938.

Following a dinner at the Hotel Lincoln Gertrude L. Fife of the University Hospitals of Cleveland, Ohio, addressed the group on "Anesthesia in Cardiac Surgery," illustrating her talk with moving pictures of the heart operations being done by Dr. Claude Beck. Dr. Lynn Elston of Fort Wayne was also a guest at the meeting.

Officers for year 1938-39:

President	Mrs. Margaret P. Church, 1016 Garden St., Ft. Wayne, Ind.
Vice-President	Thelma A. Deane 130 W. Miami Ave., Logansport, Ind.
Secretary-Treasurer	Agnes M. Lange 336½ Killea Ave., Ft. Wayne, Ind.

MISSISSIPPI

The third annual meeting of the Mississippi Nurse Anesthetists' Association was held in Jackson, Miss., on April 19, 1938.

The following took part in the program:

John S. Harter, M.D., Sanatorium, Miss.
"Anesthesia in Thoracic Surgery"

R. B. Caldwell, M.D., Baldwyn Clinic, Baldwyn, Miss.
"Anesthesia and the Patient"

Margaret Angland, Charity Hospital, Laurel, Miss.
"The Value of Suggestive Therapeutics as Employed in the Administration of Anesthesia"

The following officers were elected for the year 1938-39:

President	Emma Easterling Vicksburg Hospital, Vicksburg, Miss.
1st Vice-President	Irene Mason Greenville, Miss.
2nd Vice-President	Margaret Angland Laurel General Hospital, Laurel, Miss.
Secretary-Treasurer	Mrs. Sam Owen Geo. C. Hixon Memorial Hospital, Electric Mills, Miss.
Trustees: (1 year)	Hettye Elzey, Riley Hospital, Meriden, Miss.
(2 years)	Mrs. John I. Waites Jackson, Miss.

Committees:

Nominating	Margaret Angland, Chairman Hettye Elzey Mrs. John Waites

Membership	Louise Francis Mrs. Frank Lovett Margaret Angland	*Program*	Harriett Hatchett Eddie Muse

NEW YORK

The fifth annual meeting of the New York Association of Nurse Anesthetists was held at the Statler Hotel, Buffalo, N. Y., May 19 and 20, 1938.

HAZEL BLANCHARD, President

The following officers were elected for a two-year term:

President
Hazel Blanchard
1910 Seventh Ave., Troy, N. Y.

Vice-President
Eva Dickson
Brooklyn Hospital, Brooklyn, N. Y.

Secretary
Dorothy N. Calder
Yonkers General Hospital, Yonkers, N. Y.

Treasurer
S. Louise FitzGerald
31 Normandy Ave., Rochester, N. Y.

Trustee, 1-year term)
Clara Bieber
141 W. 109th St., New York, N. Y.

MINNESOTA

The annual meeting of the Minnesota Association of Nurse Anesthetists was held in conjunction with the Minnesota Hospital Association, at the Nicollet Hotel in Minneapolis on May 19 and 20, 1938. Program in full was published in the May issue of the Bulletin.

The following officers were elected for the year 1938-39:

President	Alice L. Anderson Minneapolis General Hospital, Minneapolis, Minn.
Vice-Preident	Nora V. Swenson Swedish Hospital, Minneapolis, Minn.
Secretary	Julo Slattendale University Hospital, Minneapolis, Minn.
Treasurer	Katharine D. Jurgensen Swedish Hospital, Minneapolis, Minn.
Trustee	L. Rose Littel Minneapolis General Hospital, Minneapolis, Minn.

Hazel J. Peterson and L. Rose Littel, retiring President and Secretary, respectively, and Katharine D. Jurgensen, re-elected Treasurer, were chosen as delegates to the National convention in Dallas in September.

PENNSYLVANIA

The seventh annual meeting of the Pennsylvania Nurse Anesthetists' Association, and the fourth in conjunction with the Pennsylvania Hospital Association, was held April 27 and 28, 1938, at the William Penn Hotel, Pittsburgh, Pa. The program in full was published in the May issue of the Bulletin.

The Secretary reported a total membership of 245.

Treasurer's Report

Balance April 1, 1937		$ 567.36
RECEIPTS		
Dues	$1,252.50	
Initiation fees	37.00	
Dues received from Nat'l Ass'n for members transferred into the state	10.00	
Expenses refunded	6.00	
Dues received from disbanded district	26.33	1,331.83
		$ 1,899.19
DISBURSEMENTS		
Remitted to National Association:		
Dues	$ 656.25	
Initiation fees	30.00	
Dues paid for members transferred out of state	40.00	
Pin	.75	
Office Expenses	93.69	
Convention expenses	70.55	891.24
Balance March 31, 1938		$1,007.95
Represented by:		
Balance on deposit, Central-Penn Nat'l Bank.		$1,007.95

Officers for the year 1938-39:

President	Rose G. Donovan Mt. Sinai Hospital, Philadelphia
First Vice-President (2-year term)	Grace Williams Allegheny General Hospital, Pittsburgh
Secretary-Treasurer (2-year term)	Mrs. Helen Young Walker 1824 Wallace St., Philadelphia, Pa.
Trustees	
(2-year term)	Ida McK Emerick Rochester General Hospital, Rochester, Pa.
(2-year term)	Lucille McLaughlin Westmoreland County Hospital, Greensburg, Pa
(2-year term)	Magdalena Suter Girard College Infirmary, Philadelphia, Pa.

MICHIGAN

The Michigan Association of Nurse Anesthetists held its first annual meeting in Marquette, Michigan, in the Upper Peninsula, on June 23 and 24, 1938, in conjunction with the Michigan Hospital Association.

Miss Emma Huebner, Assistant Superintendent and anesthetist at St. Luke's Hospital, Marquette, who is a very busy person, exemplified the hospitality of the North by greeting all delegates upon arrival at the Hotel Northland. A new wing is being added to St. Luke's Hospital and Miss Huebner is taking an active interest in the completion of this work.

A joint luncheon for the medical librarians and the anesthetists was held at the Northland. The afternoon meeting was conducted as a joint session with the Michigan Hospital Association, with Miss Mary Skeoch, President of the Michigan Hospital Association and Superintendent of St. Luke's Hospital, presiding in the absence of Dr. Quennell, who was ill. The following took part in the afternoon program:

Kate Hard, Saginaw General Hospital, Saginaw
"Choosing and Keeping Personnel"
Miss Spiegel, Sparrow Hospital, Lansing
"The Record Librarian"
Esther Meil, Henry Ford Hospital, Detroit
"The Nurse Anesthetist in the Small Hospital"
Josephine Galloway, St. Luke's Hospital, Marquette
"Minimum Standards for Maintaining an Acceptable Laboratory and X-Ray Service"

At 5:00 P. M. the group was entertained at tea at the Wallace Nurses' Home by the St. Luke's Hospital Auxiliary.

At 7:30 P. M. a joint dinner was held at the Northland Hotel, at which Mr. Robert E. Neff, President of the American Hospital Association, and Mr. Walter Gries, Trustee of Ishpeming Hospital, Ishpeming, were speakers.

On Friday morning the delegates to the convention were guests of the Marquette District Nurses' Association at a breakfast which was served out of doors at Presque Island on Lake Superior. One would have had to be present in order to appreciate the combination of delicious food, fresh morning air and beautiful scenery.

At the morning session the following papers were read:

"Cyclopropane Anesthesia"
Grace Courtney, Grace Hospital, Detroit
"Nitrous Oxide and Ethylene Anesthesia"
A. Maude Galbraith, Grand Rapids
"Cyclopropane Anesthesia in Thyroid Surgery, Including the Use of Helium"
Sister Borromea, Peoria, Ill.

Luncheon was served by St. Luke's Hospital and the Northern Michigan Children's Clinic in the beautiful garden of Jacob Anderson, which adjoins the hospital grounds. In the afternoon Dr. Howe of the staff of St. Luke's Hospital welcomed the anesthetists, and spoke on various aspects of the work of anesthesia.

At the business session a membership of 93 was reported, and a balance of $140.00 in the treasury. The following officers were elected for the year 1938-39:

President	Esther Meil Henry Ford Hospital, Detroit
First Vice President	Florence Howard Woman's Hospital, Detroit
Second Vice President	Mabel Courtney Grace Hospital, Detroit
Secretary-Treasurer	Ione Wessinger Henry Ford Hospital, Detroit
Trustee	Christine Kempton Florence Crittenden Hospital, Detroit

MID-SOUTH GRADUATE NURSE ANESTHETISTS' ASSEMBLY

President	Harriett Hatchett Fite Hospital, Columbus, Miss.
Vice-President	Jamie Bramlett Oxford, Miss.
Vice-President	Gertrude A. Troster Memphis, Tenn.
Vice-President	Martha H. Junkin Fort Smith, Ark.
Executive Secretary	Alice Maurine Sims 704 Goodwyn Institute, Memphis, Tenn.

Saidie Louise Heckert

We regret to announce the sudden death on May 7, 1938, of Miss Sadie Louise Heckert, 3326 West 29th Avenue, Denver, Colo.

Miss Heckert was an active and interested member of the National Association for four years, and served as Secretary-Treasurer of the Colorado Nurse Anesthetists' Association from its organization on June 6, 1936 until her death.

Members National Association of Nurse Anesthetists

July 1, 1938

ALABAMA		
Beddow, Annie M.	Norwood Hospital	Birmingham
Bell, Fannie R.	St. Vincent's Hospital	Birmingham
Bradford, Elizabeth	South Highlands Infirmary	Birmingham
Burnes, Sarah Ola	Forrest General Hospital	Gadsden
Culver, Edith	708 Tuscaloosa Ave.	Birmingham
Hill, Mrs. Emily McClinton	Bellamy Hospital	York
Holmquist, Edith	South Highland Infirmary	Birmingham
Kilpatrick, Mrs. Wanita	1606 South 12th Avenue	Birmingham
Long, Mrs. Elsie Owens	939 South 20th St.	Birmingham
Maenner, Rose E.	59 Le Moyne Place	Mobile
Michaelis, Clara	310-11 First Nat'l Bank Bldg.	Birmingham
O'Curran, Irene E.**	St. Vincent's Hospital	Birmingham
O'Dell, Mrs. Mary Hibbetts	2410 Arlington Ave.	Birmingham
Parks, Mary Blande*	Druid City Hospital	Tuscaloosa
Rice, Verna M.	R. F. D. No. 1, Box 116	Mobile
Stone, Clara	429 N. Walnut St.	Florence
Traber, Anna	2020 South 11th Avenue	Birmingham
Warlick, Hattie***	1127 South 12th St.	Birmingham
Wilbanks, Mary C.	West End Baptist Hospital	Birmingham
ARIZONA		
Christian, Marion McBride	Cochise County Hospital	Douglas
Dearing, Lennie B.***	Box 88	Flagstaff
Maire, Frances H.	907 Nat'l Valley Bank Bldg.	Tucson
ARKANSAS		
Brown, Martha	Davis Hospital	Pine Bluff
DeLoach, Mary T.	Cora Donnell Hospital	Prescott
Petty, Blanche G.	726 Donaghey Bldg.	Little Rock
Pollard, Katie	St. Vincent's Infirmary	Little Rock
Raper, Edith W.	Trinity Hospital	Little Rock
Summers, Mrs. Mary D.	Julia Chester Hospital	Hope
Tate, Mrs. Thelma R.	St.Louis Southwestern Ry. Hosp.	Texarkana
CALIFORNIA		
Andersen, Emmeline	Mercy Hospital	Sacramento
Anderson, Vera M.	390 Central Avenue	Oakland
Armitage, Irene R.	Paradise Valley Sanitarium	National City
Barbee, Genevieve	1318 Pine St.	Martinez
Barker, Betty	1167 Bush St.	San Francisco
Bartron, Kathryn	1167 Bush St.	San Francisco
Bates, Alta A.	Alta Bates Hospital	Berkeley
Berry, Comfort A.	628 — 28th St.	Oakland
Bickel, Martha	Franklin Hospital	San Francisco
Bishop, Mrs. Anna K.	75 Dolores St.	San Francisco
Black, Minnie M.	Letterman General Hospital	San Francisco
Bolton, Gladys M.	Samuel Merritt Hospital	Oakland
Bulin, Emma J.	Jackson Lake Hospital	Oakland
Bush, Wilna G.	Franklin Hospital	San Francisco
Cain, Laura Louise	1530 Marsh St.	San Luis Obispo
Clark, Mrs. Bertha M.	837 — 450 Sutter	San Francisco
Clutton, Evangeline M.	Peralta Hospital	Oakland
Dean, Mrs. Mildred Waggoner	241 — 29th St., Apt. 7	Oakland

* President State Association
** Secretary State Association
*** Associate member

Deering, Bessie G.	Sutter Hospital	Sacramento
Doran, Irene	21 Park Hill Avenue	San Francisco
Duffey-Fox, Mrs. Laura De Ette	Box 73	Sanitarium, Napa County
Duncan, Cleo	c/o Mrs. Gay Morgan, 807 — 39th Avenue	San Francisco
East, Lettie V.	San Joaquin Hospital	French Camp
Ellis, Mrs. Vyevene	1005 Hyde St.	San Francisco
Gaymer, Dorothy	Kern General Hospital	Bakersfield
Gillen, Julia***	574 Walnut St.	Palo Alto
Goulet, Minnie	Mercy Hospital	Sacramento
Graham, Mrs.Katherine H.	San Francisco Hospital	San Francisco
Grimes, Flora A.	Sutter Hospital	San Francisco
Grunewald, Louise I.	East Oakland Hospital	East Oakland
Guptill, Martha M.	Samuel Merritt Hospital	Oakland
Hall, Priscilla	St. Frances Hospital	San Francisco
Hanson, Nell J.	431 — 30th St., Apt. 3	Oakland
Hebert, Marie Lya	Dameron Hospital	Stockton
Hoover, Mrs. Zola P.	Route 7, Box 4119	Sacramento
Huntimer, W. Serena	St. Mary's Hospital	San Francisco
Jevne, Mrs. Sophie	6331 Hollywood Blvd.	Hollywood
Johnson, Mary	1904 Franklin St.	Oakland
Jones, Edith H.	St. Francis Hospital	San Francisco
Keenan, Katherine	4100 Fulton St.	San Francisco
Kemp, Ada Irene	Franklin Hospital	San Francisco
Kittleson, Beatrice M.	Peninsula Community Hospital	Carmel-by-the-Sea
Krekeler, Mrs. Irene F.***	523 B. 42nd St.	Oakland
Kulchar, Helen E.	East Oakland Hospital	Oakland
Lewis, Myrna	Cottage Hospital	Santa Barbara
Logan, Mrs. Marian Yost	899 Green St.	San Francisco
McCoppin, Margaret	721 — 28th St.	Sacramento
McKinstry, Dorothy C.	565 — 14th Street	San Francisco
Malamphy, May	2085 Hayes Street	San Francisco
Moore, Greta	4930 H. Street	Sacramento
Morgan, Mrs. Gay**	807 — 39th Avenue	San Francisco
Neu, Ellen E.	1515 S. Holt Aveneue	Los Angeles
Peck, Virginia	502 Flood Bldg.	San Francisco
Pence, Mada	Enloe Hospital	Chico
Peters, Lillian L.	San Francisco Hospital	San Francisco
Piercy, Mrs. F. Margaretta	San Francisco Hospital	San Francisco
Pray, Jean H.	431 — 30th Street	Oakland
Pringle, Mrs. Gertrude N.	65 Buena Vista Ave.	San Francisco
Quarles, Myra B.	Children's Hosp. of the East Bay	Oakland
Rogers, Margaret C.	329 S. 5th Street	San Jose
Sister M. Remigia	St. Joseph's Hospital	San Francisco
Schreiber, Olga E.	Woodland Clinic	Woodland
Schriver, K. Kelly	Mercy Hospital	Sacramento
Schultz, Adella I.	Providence Hospital	Oakland
Searcy, Geraldine L.	San Francisco Hospital	San Francisco
Seroy, Jeanette	San Joaquin General Hospital	Stockton
Smith, Louise A.	3226 Glenhurst Ave.	Los Angeles
Snail, Mrs. Alice E.	Tuolumne County Hospital	Sonora
Snodgrass, Mrs. Nan	St. Francis Hospital	San Francisco
Sperry, Mrs. Elizabeth B.	Ahwahnee Sanitarium	Ahwahnee
Sponheim, Mina G.	Samuel Merritt Hospital	Oakland
Stevenson, Mrs. Mary J. Roche*	Franklin Hospital	San Francisco

* President State Association
** Secretary State Association
*** Associate member

Stuart, Linda M.	Santa Barbara Hospital	Santa Barbara
Taylor, Jeanette	502 Flood Bldg.	San Francisco
Tynan, Gertrude L.	Providence Hospital	Oakland
Vortman, Helen A.	1815 Commercial Way	Sacramento
Watkins, Kathryn	Samuel Merritt Hospital	Oakland
Wilkinson, Irma	2625 Parker Avenue	Oakland
Wilson, Eva M.		
Winter, Cecelia M.	Cottage Hospital	Santa Barbara

COLORADO

Adair, Helen M.	Children's Hospital	Denver
Bowden, Louise E.	675 Albion St.	Denver
Carpenter, May Morcom*	2370 Ash Street	Denver
Currie, Ethel F.	Presbyterian Hospital	Denver
Hansbrough, Elizabeth	Fitzsimons General Hospital	Denver
Kramer, Margaret L.	Corwin Hospital	Pueblo
MacFarland, Mrs. Louise Paine	Parkview Hospital	Pueblo
Sister Rose Bernadette	St. Joseph Hospital	Denver
Sister Mary Sylvester	Mt. San Rafael Hospital	Trinidad
Moon, Henrietta M.	Presbyterian Hospital	Denver
Schnepper, Louise H.	Boulder Sanitarium	Boulder
Stevens, Mrs. Ann McDonald	935 Colorado Blvd.	Denver

CONNECTICUT

Allcock, Alice	Charlotte Hungerford Hospital	Torrington
Allison, Mary Vine	Meriden Hospital	Meriden
Baker, Mrs. Gertrude M.	Danbury Hospital	Danbury
Bander, Edna M.	New Haven Hospital	New Haven
Blaney, May V.	St. Francis Hospital	Hartford
Boyer, Alpha J.	810 Howard Ave.	New Haven
Bulger, Mrs. Anne S.	Day Kimball Hospital	Putnam
Clarke, Lula Agnes	Litchfield County Hospital	Winsted
Davis, Mrs. Sarah Jane	Litchfield County Hospital	Winsted
Fanning, Julia Frances	New Britain General Hospital	New Britain
Gardner, Martha Elizabeth	Bridgeport Hospital	Bridgeport
Golding, Mildred I.	Lawrence & Mem'l Associated Hospitals	New London
Gordon, Mary K.	Mt. Sinai Hospital	Hartford
Hunt, Alice M.	New Haven Hospital	New Haven
Hutchinson, Doris I.	Manchester Mem'l Hospital	Manchester
Jenne, Mary A.	350 Congress Ave.	New Haven
McCarthy, Dorothy	Bridgeport Hospital	Bridgeport
MacPherson, Margaret	St. Vincent's Hospital	Bridgeport
Nast, Mrs. Karoline W.	Day Kimball Hospital	Putnam
Norwood, Alice L.	Charlotte Hungerford Hospital	Torrington
O'Donnell, Ann Rita	St. Francis Hospital	Hartford
Powers, Annie E.	370 Collins St.	Hartford
Ryan, Ellen	883 Quinnipiac St.	New Haven
Smyser, A. Pauline	Bristol Hospital	Bristol
Stover, Ethel	Bridgeport Hospital	Bridgeport
Vezina, Clara A.	Bridgeport Hospital	Bridgeport

DELAWARE

McCool, M. Vivian	Wilmington General Hospital	Wilmington
Powell, Jessie E.	Delaware Hospital	Wilmington

* President State Association
** Secretary State Association
*** Associate member

DISTRICT OF COLUMBIA

Fox, Carrie Belle C.	2407 — 15th St. N.W.	Washington
Witter, Kathryn G.	Walter Reed General Hospital	Washington

FLORIDA

Brown, Mrs. Mary C.	1135 S.W. 12th St.	Miami
Brush, Mrs. Nathalie	1410 Emma St.	Tampa
Burg, Mrs. Flora M.		Brooksville
Caldwell, Mrs. Thelma	Alton Road Hospital	Miami Beach
Card Jennie A.	1450 S.W. 7th St.	Miami
Compton, Evon E.	1227 Greenwood Avenue	Orlando
Creelman, Margaret E.	Tampa Municipal Hospital	Tampa
Davis, Mrs. Inez Grover	Municipal Hospital	Tampa
Davis, Nellie G.	1426 — 9th North St.	St. Petersburg
Edwards, Mrs. Ruth Hoyt***		Zellwood
Ellis, Ida Tedford*	1210 Kuhl Avenue	Orlando
Gassner, Edith	Mound Park Hospital	St. Petersburg
Grant, Iva S.**	108 E. Central Avenue	Orlando
Hathaway, Belle	Monroe Hotel	St. Augustine
Holton, Mrs. Edith F.	Tampa Municipal Hospital	Tampa
Kenney, Florence	St. Francis Hospital	Miami
Kossack, Michalina A.	Dade County Hospital	Miami
Wells, Hazel B.	Orange General Hospital	Orlando

GEORGIA

Bresnahan, Mary	Central of Georgia Railw'y Hosp.	Savannah
Burdette, Agnes	Middle Georgia Hospital	Macon
Campbell, Bernice	Emory University Hospital	Emory University
Caraway, Billie B.	Georgia Baptist Hospital	Atlanta
Carnes, Rhea	Archbold Mem'l Hospital	Thomasville
Dasher, Annie Laurie	202 E. Liberty St.	Savannah
Hohenschultz, Caroline	St. Joseph Hospital	Atlanta
Hume, Margaret E.	Archbold Mem'l Hospital	Thomasville
Knight, Ethel	Phoebe Putney Mem'l Hospital	Albany
McDonald, Mrs. Rosalie C.	Emory University Hospital	Emory University
Rapp, Mrs. W. W.	285 North Avenue, N.W.	Atlanta
Ross, Grace	Grady Hospital	Atlanta
Rowzee, Theo Lanier	1120 Doctors Bldg.	Atlanta
Vickers, Leola	Grady Hospital	Atlanta
Warman, Halo	Emory University Hospital	Emory University

IDAHO

Butler, Selma J.	Box 129	Cottonwood
Donley, Helene	Idaho Falls L.D.S. Hospital	Idaho Falls
Henggeler, Martha M.	917½ Fort Street	Boise
Johnson, Elsie P.	Route 1	Hazelton
Sister Joseph Arthur	Providence Hospital	Wallace
Sister Mary Helen	Our Lady of Consolation Hosp.	Cottonwood

ILLINOIS

Abell, Ora E.	Schmitt Memorial Hospital	Beardstown
Allen, Lulu Clara	Evangelical Deaconess Hospital	Freeport
Arns, Irene	Oak Park Hospital	Oak Park
Atkinson, Alice E.	South Shore Hospital	Chicago
Baines, Julia T.	1368 Sedgwick St.	Chicago
Baumgartner, Lottie M.	West Suburban Hospital	Oak Park
Beahan, Elizabeth A.	West Suburban Hospital	Oak Park
Berg, Anna B.	Community Hospital	Geneva

* President State Association
** Secretary State Association
*** Associate member

Blickendorfer, Anna	536 Webster Avenue	Chicago
Botsford, Daisy G.	1324 No. Sheridan Road	Waukegan
Braun, Margie V.	420 S. Harlem Ave.	Freeport
Brooks, Margaret	Moline Public Hospital	Moline
Brooks, Mary	Henrotin Hospital	Chicago
Burke, Ursula M.	Evanston Hospital	Evanston
Cameron, Mrs. Mae B.	Ravenswood Hospital	Chicago
Clardy, Grace I.	Garfield Park Hospital	Chicago
Colvin, Thelma V.	Hinsdale Sanitarium & Hospital	Hinsdale
Costenbader, Catherine E.	Evanston Hospital	Evanston
Coupland, Margaret	Methodist Hospital	Peoria
Crane, Mrs. Katherine	1912 E. Spruce St.	Springfield
Crowley, Mechtildes C.	St. Francis Hospital	Peoria
Daniels, Clorecia	653 Belmont Ave.	Chicago
Davis, Clara Fern***	Springfield Hospital	Springfield
Diediker, Matilda	West Suburban Hospital	Oak Park
Diveley, Mary F.	2030 N. Lowber St.	Decatur
Duray, Mary	Mt. Sinai Hospital	Chicago
Egleston, Ada M.	American Hospital	Chicago
Engen, Christine G.	840 Center St.	Elgin
Falconer, Geneva B.	St. John's Nurses' Home	Springfield
Ford, Lauda S.	Augustana Hospital	Chicago
Fossum, Alma	1138 N. Leavitt St.	Chicago
Ganzbuhl, Margaret	St. Anthony's Hospital	Chicago
Girkin, Nettie R.	Michael Reese Hospital	Chicago
Gregory, Caroline C.	Mercy Hospital	Chicago
Gruska, Hermina E.	Jackson Park Hospital	Chicago
Guibor, Mrs. Helen	536 Christie St.	Ottawa
Hallowell, Esther	Silver Cross Hospital	Joliet
Halm,Vincentia G.	2449 S. Dearborn	Chicago
Hansen, Elizabeth T.	Henrotin Hospital	Chicago
Hansing, Bertha	699 Deerpath	Lake Forest
Hard, Mabel D.	Jackson Park Hospital	Chicago
Hartley, Ora Mae	Grant Hospital	Chicago
Hellickson, Helga C.	Ravenswood Hospital	Chicago
Hellman, Marjorie	St. Joseph's Hospital	Chicago
Hickey, Mary C.	South Shore Hospital	Chicago
Hoagland, Jennié	Cook County Hospital	Chicago
Hoffman, Gladys Mary	Englewood Hospital	Chicago
Holmes, Edith Helen	1044 N. Francisco	Chicago
Hunt, Valeda V.	Mt. Sinai Hospital	Chicago
Kasten, Mary C.	St. Anne's Hospital	Chicago
Kedas, Anne Ellen	Michael Reese Hospital	Chicago
Kelly, Margaret W.	Westlake Hospital	Melrose Park
Klein, Grace***	St. Ann's Hospital	Chicago
Kraus, Paula	740 Hayes Ave.	Oak Park
Krawczyk, Anna A.	Woodlawn Hospital	Chicago
Lane, Maud	Englewood Hospital	Chicago
Lebkuecher, Ethel M.	Decatur & Macon Co. Hospital	Decatur
Lee, Agnes J.	Norwegian American Hospital	Chicago
Leidel, Leeta	Wabash Hospital	Decatur
Lemmons, Geneva	704 N. Kedzie Ave.	Chicago
Lenihan, Julia	Frances Willard Hospital	Chicago
Lewis, Hattie M.	St. John's Hospital	Springfield
Lindsey, Mrs. Grace V.***	221 N. Glen Oak	Peoria
Loehrke, Amelia J.	427 Dickens Ave.	Chicago
Lutz, Elizabeth A.	4807 N. Paulina St.	Chicago

* President State Association
** Secretary State Association
*** Associate member

McCall, Catherine	Frances E. Willard Hospital	Chicago
McDermott, Esther L.	Evanston Hospital	Evanston
McGinley, Edith	St. Luke's Hospital	Chicago
McGraw, Mary R.	Little Company of Mary Hosp.	Evergreen Park
Mahoney, Alice I.	5735 S. Wood St.	Chicago
Marsh, Margaret	310 N. Broadway	Joliet
Mausz, Angelene	Garfield Park Community Hosp.	Chicago
Meinhardt, Frances	Illinois Masonic Hospital	Chicago
Modaff, Louise	7142 N. Keystone Ave.	Morton Grove
Mulvane, Lucile	R. F. D.	Robinson
Murray, Edna M.	J. C. Hammond City Hospital	Geneseo
Myers, Leone M.	Ravenswood Hospital	Chicago
Myrseth, Gudrun	Ingalls Mem'l Hospital	Harvey
Nelson, Anna N.	Grant Hospital	Chicago
New, Margaret O.	West Frankfort Union Hospital	West Frankford
Newton, Mary Margaret	Methodist Hospital	Peoria
Nichol, Mabel A.	650 Park St.	Elgin
Nugent, Agnes L.	2861 N. Clark St.	Chicago
O'Day, Exire	Ravenswood Hospital	Chicago
O'Kane, Selene	P. O. Box 167	Shabbona
O'Leary, Helen E.	Passavant Hospital	Chicago
Olson, Anna M.	Grant Hospital	Chicago
Pettigrew, Sara N.	105 West 3rd St.	Sterling
Pippereit, Martha A.	Chicago Mem'l Hospital	Chicago
Priester, Ann	West Suburban Hospital	Oak Park
Rau, Myrtle E.	11321 Wentworth Ave.	Chicago
Reynolds, Vera	Pekin Public Hospital	Pekin
Riley, Alice M.	Augustana Hospital	Chicago
Rinella Edris P.	Illinois Central Hospital	Chicago
Ronn, Anna M.	Passavant Hospital	Chicago
Roth, Jean	Mercy Hospital	Chicago
Sister M. Ambrose	2700 W. 69th St.	Chicago
Sister Andrea Weisgerber	St. Anthony's Hospital	Effingham
Sister Angilberta	St. Theresa Hospital	Waukegan
Sister M. Antonella Rauch	St. Joseph's Hospital	Joliet
Sister M. Antonita Walloch	St. Joseph's Hospital	Joliet
Sister Bernadine Shaudis	St. John's Hospital	Springfield
Sister M. Borgia Gabrys	St. Anthony Hospital	Chicago
Sister M. Borromea	St. Francis Hospital	Peoria
Sister Capistrana Hylla	St. John's Hospital	Springfield
Sister M. Caroline Zirkel	St. Charles Hospital	Aurora
Sister M. Cleta Mehn	St. Elizabeth's Hospital	Granite City
Sister M. Conradine	St. Anthony's Hospital	Chicago
Sister M. Cyprian	1120 N. Leavitt	Chicago
Sister Florine Nitzpan	St. Mary's Hospital	Decatur
Sister M. Gordiana	St. Joseph's Hospital	Elgin
Sister M. Heribert Nowak	St. Francis Hospital	Freeport
Sister M. Hortense	St. Joseph's Hospital	Joliet
Sister M. Irmengard	St. Joseph's Hospital	Joliet
Sister Jean Sudkamp	St. Elizabeth's Hospital	Belleville
Sister Jovita Schumann	St. Joseph's Hospital	Joliet
Sister M. Kunigunda	St. Mary's Hospital	La Salle
Sister M. Loyola Panter	St. Francis Hospital	Freeport
Mother Magdalene ***	St. Francis Convent	Riverton
Sister Marianna Cassellius	St. Charles Hospital	Aurora
Sister Materna Boronowski	St. Francis Hospital	Litchfield
Sister M. Mildred Sauer	St. Joseph's Hospital	Elgin

* President State Association
** Secretary State Association
*** Associate member

Sister St. Bernard	St. Bernard's Hospital	Chicago
Sister St. Henry	Huber Mem'l Hospital	Pana
Sister Saint Marg. Mary	St. Bernard's Hospital	Chicago
Sister M. Louise Odenthal	St. Joseph's Hospital	Joliet
Sister M. Oswalda	St. Joseph's Hospital	Elgin
Sister Pudencia Gaffron	St. John's Hospital	Springfield
Sister Regula	St. John's Hospital	Springfield
Sister Rudolpha	St. John's Hospital	Springfield
Sister St. Joan of Arc	St. Bernard Hospital	Chicago
Sister Sophie Gebhard	St. John's Hospital	Springfield
Sister M. Stephanie	2700 W. 69th St.	Chicago
Sister M. Theresa	St. Anthony de Padua Hospital	Chicago
Seater, Mary Dunn	St. John's Hospital	Springfield
Sed, Julia	St. Joseph's Hospital	Chicago
Shaw, Jean	Oak Park Hospital	Oak Park
Smallwood, Dorothy	Belmont Hospital	Chicago
Speers, Helen Marie	2540 Lakeview Avenue	Chicago
Stenstrom, Naomi S.	South Shore Hospital	Chicago
Stephens, Mrs. Edna M.	Sherman Hospital	Elgin
Stoltz, Frieda L.	St. Luke's Hospital	Chicago
Suttle, Ethel M.	St. Francis Hospital	Macomb
Talcott, Mrs. Marie	Lincoln Hospital	Rochelle
Terry, Anna M.	West Suburban Hospital	Oak Park
Teubel, Pauline E.	P. O. Box 265	Evergreen Park
Tyler, Dorothy	St. Luke's Hospital	Chicago
Vincent, Nelle G.	Evanston Hospital	Evanston
Welinske, Matilda A.	St. Francis Hospital	Evanston
Whitford, Mrs. Mae L.	Collins Clinic	Peoria
Whitney, Madge	Wilder Clinic	Chicago
Willenborg, Anna	18 East Division Street	Chicago
Zech, Elizabeth D.	Evanston Hospital	Evanston

INDIANA

Church, Margaret P.*	1016 Garden St.	Fort Wayne
Deane, Thelma A.	130 W. Miami Ave.	Logansport
Efinger, Irene H.	St. Mary's Hospital	Evansville
Fox, Mrs. Nelle***	524 W. Sycamore	Kokomo
Guckian, Helen K.	St. Mary's Hospital	Evansville
Hane, Mrs. Ruth Hagen	Engle Road, Route 6	Fort Wayne
Kirschner, Regina R.	Marion Gen'l Hospital	Marion
Lange, Agnes M.**	336½ Killea Ave.	Fort Wayne
Like, Fern	515 So. 6th St.	Vincennes
Reitz, Helen M.	St. Mary's Hospital	Evansville
Von der Au, Anna	2902 Fairfield Ave.	Fort Wayne
Warnock, Inez	Moore Clinic	Muncie

IOWA

Anderberg, Marian P.	2919 Grandview Blvd.	Sioux City
Brandt, Alma M.	Deaconess Hospital	Marshalltown
Ewer, Bertha A. L.	401 Security Bldg.	Sioux City
Flynn, Mrs. Mary E.	318 Linden Ave.	Waterloo
Hanner, Bonnie Bell	712 Parnell St.	Des Moines
Kiely, Ruth G.	St. Joseph's Mercy Hospital	Sioux City
Meyer, Marian L.	St. Joseph's Mercy Hospital	Mason City
Morgan, Velma Mae	1200 Main St.	Dubuque
Robson, Marie K.	308 Toy Nat'l Bank Bldg.	Sioux City
Sister M. Aloysius	St. Joseph's Mercy Hospital	Centerville

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Sister M. Gonzaga	Mercy Hospital	Des Moines
Sister Margaret Mary Kane	St. Joseph's Mercy Hospital	Sioux City
Sister M. Natalie Senecal	St. Joseph's Mercy Hospital	Centerville
Sister M. Pauline Hammes	Mercy Hospital	Des Moines
Sister M. Thomas Wilson	Mercy Hospital	Council Bluffs
Schwarting, Louise	Lutheran Hospital	Fort Dodge
Smith, Ethel	517 High Ave., E.	Oskaloosa
Thompson, Helen M.	212 Ankeny Bldg.	Clinton
Wright, Ruth	Burlington Hospital	Burlington
KANSAS		
Baker, Viola H.	Wesley Hospital	Wichita
Mikkola, Senia I.	Wesley Hospital	Wichita
Paul, Mrs. Ethel S.	Wesley Hospital	Wichita
Peterson, Mrs. Lavida***		Miller
West, Wanda G.	111 W. 10th St.	Concordia
KENTUCKY		
Bloom, Estelle	822 Heyburn Bldg.	Louisville
Diebold, Ruth	St. Joseph's Hospital	Lexington
Duncan, Mrs. Davida Goodman		Columbia
Haverkamp, Etta	217 Van Voast Ave.	Bellevue
Salt, Susan R.	641 Park Ave.	Newport
Smith, Tommie	1110 Francis Bldg.	Louisville
Woody, Margaret L., Mrs.	1026 S. 4th St., Apt. 21	Louisville
LOUISIANA		
Forsman, Rosalie M.	St. Francis Sanitarium	Monroe
Gebs, Lillian M.	Charity Hospital	New Orleans
Grillet, Agnes	628 Fern St.	New Orleans
Grillet, Stella	628 Fern St.	New Orleans
Hauswald, Antoinette A.	Hotel Dieu	New Orleans
Koenig, Mary E.	Charity Hospital	New Orleans
Rhodes, Sue	1821 Orleans St.	New Orleans
Seeberg, Molly L.	U. S. Marine Hospital	New Orleans
Simoneaux, Lise	Ellender Mem'l Hospital	Houma
MAINE		
Brown, Mrs. Helen C.	128 Park Ave.	Portland
Chaney, Mrs. Ardell M.	Children's Hospital	Portland
Denton, Helen G.		Caribou
Greene, Gretchen V.	Eastern Maine Gen'l Hospital	Bangor
Greenleaf, Lona M.	Mt. Desert Island Hospital	Bar Harbor
Roy, Lillian B.	Maine General Hospital	Portland
Sullivan, Margaret F.	Eastern Maine General Hospital	Bangor
MARYLAND		
Argus, Clara	831 N. Washington St.	Baltimore
Berger, Olive L.	Johns Hopkins Hospital	Baltimore
Black, Mrs. Constance***	South Baltimore Gen'l Hospital	Baltimore
Carl, Dorothy M.	4309 Chatham Road	Baltimore
Elliott, Ruth S.	South Baltimore Gen'l Hospital	Baltimore
Hoyt, Margaret L.	Washington Sanitarium & Hosp.	Takoma Park
Kavanagh, Mary T.	St. Joseph's Hospital	Baltimore
Mauk, Martha E.	229 Union St.	Cumberland
O'Brien, Mary J.	University of Maryland Hosp.	Baltimore

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Owings, Frances	Johns Hopkins Hospital	Baltimore
Pusey, Alyce M.	Emergency Hospital	Easton
Richardson, Virginia L.	831 N. Washington St.	Baltimore
Smith, Grace L.	Johns Hopkins Hospital	Baltimore
South, Genevieve A.	Sinai Hospital	Baltimore
Tyler, Amelia L.	Peninsula Gen'l Hospital	Salisbury
Weick, Anna M.	U. S. Marine Hospital	Baltimore
White, M. Adelaide	Johns Hopkins Hospital	Baltimore
Yarnall, Catherine E.	U. S. Naval Hospital	Annapolis
Zerhusen, Ann L.	12 West Read St., Apt. M.	Baltimore

MASSACHUSETTS

Anderson, Clara E.	107 Lowell Ave.	Newton Mills
Bliss, Jessie M.	Quincy City Hospital	Quincy
Bond, Mrs. Helen Cooper	Mass. State Infirmary	Tewksbury
Bralley, Belva B.	St. Luke's Hospital	New Bedford
Burnett, Anna P.	Harrington Mem'l Hospital	Southbridge
Eagles, Beatrice C.	St. Luke's Hospital	New Bedford
Gerrard, Gertrude M.	Peter Bent Brigham Hospital	Boston
Haigwood, Hattie B.	U. S. Marine Hospital	Chelsea
Hodgins, Agatha C. Honorary President National Association	Bridge St.	Chatham
Hunt, Christine Mary	House of Mercy Hospital	Pittsfield
Kirby, Mrs. Matilda F.***	Russell's Mills Road	N. Dartmouth
Knowlton, Carrie B.	Lowell General Hospital	Lowell
Lank, Betty E.	Children's Hospital	Boston
Lewis, Dilys A.	Harrington Mem'l Hospital	Southbridge
Macfadden, Shamah N.	Leominster Hospital	Leominster
MacRae, Elizabeth F.	Peter Bent Brigham Hospital	Boston
Mosher, Faye R.	11 Park Drive	Boston
Sawyer, Myra L.	c/o Amer. Board, 14 Beacon St.	Boston
Stevens, Louise A.	219 Clark Road	Brookline
Sword, Esther	Shriner's Hospital for Crippled Children	Springfield
White, Isabelle W.	64 Hayes Avenue	Lowell

MICHIGAN

Allison, Clara E.	Nichols Hospital	Battle Creek
Aubrey, Anna E.	Receiving Hospital	Detroit
Baird, Lillian G.	University Hospital	Ann Arbor
Barron, Loretta	Leila Y. Post Hospital	Battle Creek
Beach, Emma B.	1407 Janes Ave.	Saginaw
Becker, Dora	Butterworth Hospital	Grand Rapids
Bell, Doris E.	Woman's' Hospital	Detroit
Bilyea, Clara	1190 Seward	Detroit
Blakley, Sarah I.	Children's Hospital	Detroit
Blue, Margaret E.	Mercy Hospital	Benton Harbor
Bradbury, Nelle	Grosse Point Cottage	Grosse Point
Casey, Edith M.	520 Forrest	Ann Arbor
Costello, Josephine Z.	Alexander Blain Hospital	Detroit
Coté, Angela B.	1298 Fourth St.	Muskegon
Crosby, Alice C.	W. A. Foote Mem'l Hospital	Jackson
Courtney, Mabel E.	Grace Hospital	Detroit
Currie, Laurel M.	Wyandotte Hospital	Wyandotte
Davis, Gilly E.	Florence Crittenton Hospital	Detroit
Deeks, Dorothy	3740 John R. St.	Detroit

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Dow, Verna E.	University of Michigan Hospital	Ann Arbor
Doyle, Virginia	Hurley Hospital	Flint
Drobnek, Helen C.	Mercy Hospital	Benton Harbor
Dudewicz, Helen	St. Mary's Hospital	Saginaw
Eckhart, Carmen A.	Redford Receiving Hospital	Detroit
Emery, Alda M.	Providence Hospital	Detroit
Esper, Agnes	3740 John R St.	Detroit
Filter, Ruth M.	Hurley Hospital	Flint
Fleming, Bridget A.	St. Mary's Hospital	Saginaw
Fletcher, Mamie J.	Receiving Hospital	Detroit
French, Mrs. Bessie M.	Women's Hospital	Flint
Galbraith, A. Maude	212 Antisdel Place, N. E.	Grand Rapids
Golrick, Meta	Hurley Hospital	Flint
Goode, Margaret T.	Woman's Hospital	Detroit
Greene, Thelma	Grace Hospital	Detroit
Greenway, Emma	Receiving Hospital	Detroit
Gribble, Mrs. L.	7368 Poe Avenue	Detroit
Hain, Alice L.	Evangelical Deaconess Hospital	Detroit
Hazzard, Mrs. Mary	Gerber Mem'l Hospital	Fremont
Hendricks, Esther M.	3740 John R St.	Detroit
Hill, Maude	81 Franklin St.	Houghton
Hopkins, Mrs. Ida M.	St. Mary's Hospital	Detroit
Howard, Florence C.	Woman's Hospital	Detroit
Huebner, Emma M.	St. Luke's Hospital	Marquette
Huffman, Annie	7125 W. Jefferson Ave.	Detroit
Ilgenfritz, Esther L.	St. Joseph's Mercy Hospital	Pontiac
Kelley, Winifred	Mercy Hospital	Bay City
Kempers, Norma C.	University Hospital	Ann Arbor
Kempton, Christine B.	Florence Crittenton Hospital	Detroit
Killingworth, Aleise	Hurley Hospital	Flint
Kinloch, Dorothy C.	Receiving Hospital	Detroit
Koshel, Ann Mae		
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Leuzinger, Mrs. Dorothy	Highland Park Gen'l Hospital	Highland Park
Long, Florence H.	Saginaw Gen'l Hospital	Saginaw
McCool, Barbara	St. Mary Hospital	Detroit
McDonald, Theresa	St. Mary Hospital	Detroit
McKnight, Mary T.	Saginaw General Hospital	Saginaw
Martin, Mrs.Mary Sturgeon	218 Ferris St.	Ypsilanti
Masselink, Mrs. Lucy Colborn		McBain
Meil, Esther J.*	Henry Ford Hospital	Detroit
Moir, Ethel M.	2710 W. Grand Blvd.	Detroit
Muse, Eddie	W. A. Foote Mem'l Hospital	Jackson
Myers, Gertrude M.	4717 Avery Ave.	Detroit
Perry, Mae A.	Goodrich General Hospital	Goodrich
Rusche, Vied Marie	16530 Patton	Detroit
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Sister Alphonse Liguori	St. Joseph Sanitarium	Mt. Clemens
Sister M. Aquina Leenders	St. Francis Hospital	Escanaba
Sister Clara Behnke	Evangelical Deaconess Hospital	Detroit
Sister M. Constance Steffes	Borgess Hospital	Kalamazoo
Sister Eulalia McGivern	St. Joseph Mercy Hospital	Detroit
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Sheehan, Elizabeth	1050 Hibbard Ave., Apt. 27	Detroit
Shuff, Frances	Eloise Hospital	Eloise
Singer, Barbara	8328 Townsend Ave.	Detroit
Smith, Mary B.	Receiving Hospital	Detroit
Snider, Ada	Florence Crittendon Hospital	Detroit
Snyder, Hazel P.	Eloise Hospital	Eloise
Stefaniak, Anne B.	Eloise Hospital	Eloise
Stephens, Alice L.	Wyandotte General Hospital	Wyandotte
St. Pierre, Ozity	Harper Hospital	Detroit
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Teal, Bernice R.	University of Michigan Hospital	Ann Arbor
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Walsh, Jean A.	Providence Hospital	Detroit
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Weigand, Marion	156½ E. Front St.	Traverse City
Wessinger, Ione**	Henry Ford Hospital	Detroit
Wood, Mrs. Priscilla Barbary	801 Main St.	Niles
Zolman, Mrs. Alice V.	Pontiac General Hospital	Pontiac

MINNESOTA

Anderson, Alice L.*	Minneapolis Gen'l Hospital	Minneapolis
Anderson, Palma A.	Lutheran Deaconess Hospital	Minneapolis
Baer, Maple A.	St. John's Hospital	St. Paul
Budlong, Charlotte C.	New Asbury Hospital	Minneapolis
Clayton, Lillian B.	University Hospital	Minneapolis
Cleary, Kathleen M.	St. Luke's Hospital	St. Paul
Conlon, Theresa B.		Prior Lake
Devitt, Josephine M.	Miller Hospital	St. Paul
Eyk, Helen E.	Montevideo Hospital	Montevideo
Ferguson, Geraldine V.	Army Nurse Corps	Ft. Snelling
Filla, Julia	Charles T. Miller Hospital	St. Paul
Flaten, Olga	Stevens County Hospital	Morris
Furjainck, Marie E.	Municipal Hospital	Virginia
Gaertner, Elizabeth L.	St. Mary's Hospital	Minneapolis
Ginther, Winifred	2725 — 17th Ave. South	Minneapolis
Goblirsch, Agnes C.	1027 N. German St.	New Ulm
Grebstad, Borghild	Northwestern Hospital	Minneapolis
Gregoire, Antoinette B.	St. Andrews Hospital	Minneapolis
Gronvold, J. Marie	St. Joseph's Hospital	St. Paul
Hoseth, Petrine	St. Barnabas Hospital	Minneapolis
Hutcheon, Mary E.	Winona General Hospital	Winona
Jurgensen, Katharine D.	Swedish Hospital	Minneapolis
Kalstrom, Clarice S.		Milan
Kippen, Janet	Asbury Hospital	Minneapolis
Koch, Dorothy L.	Minneapolis General Hospital	Minneapolis
Lemke, Pearl F.	University of Minnesota Hosp.	Minneapolis
Littel, L. Rose	Minneapolis General Hospital	Minneapolis
Longley, Ella Kent	833 W. Center St.	Rochester
McCrary, Opal E.	Midway Hospital	St. Paul
Matthews, Mildred M.	Abbott Hospital	Minneapolis
Muhle, Tena	Minnesota Hospital	Minneapolis

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Nelson, Orilla H.	St. Barnabas Hospital	Minneapolis
Nickels, Christine	Swedish Hospital	Minneapolis
Nordquist, Mrs. Anna S.	Abbott Hospital	Minneapolis
Perkins, Florence E.	Miller Hospital	Duluth
Peterson, Hazel J.	Fairview Hospital	Minneapolis
Petrowski, Mrs. Marie	Ancker Hospital	St. Paul
Risse, Mayme J.	St. John's Hospital	Red Wing
Roadman, Bernice	5004 — 16th Ave., South	Minneapolis
Root, Mable G.	Midway Hospital	St. Paul
Rosengren, Myrtle E.	Shriner's Hospital	Minneapolis
Sister Caroline Pepmeier	St. Lucas Deaconess Hospital	Faribault
Sister Mary Coletta	St. Ansgar's Hospital	Moorhead
Sister M. Cornelia Lee	St. Francis Hospital	Breckenridge
Sister M. Leonissa	St. Mary Hospital	Minneapolis
Sister M. Loyola Nolan	St. Gabriel's Hospital	Little Falls
Sister Mary Philomena	St. Ansgar's Hospital	Moorhead
Sister St. Ignatius	St. Mary's Hospital	Minneapolis
Sister M. Xavier Reeves	St. Vincent's Hospital	Crookston
Seibold, Lydia B.	c/o Stanley Anderson	Randolph
Slattendale, Julo A.**	University Hospital	Minneapolis
Snobeck, Selma M.	3720 — 13th Ave. South	Minneapolis
Swenson, Nora V.	Swedish Hospital	Minneapolis
Toomey, Martha M.	St. Mary's Hospital	Duluth
Uphoff, Evelyn C.	3301 Elliott Ave.	Minneapolis
Vig, Gusta	Fairview Hospital	Minneapolis
Walthers, Ruth	St. Joseph Hospital	St. Paul
Westly, Grethe S.	Deaconess Hospital	Minneapolis
MISSISSIPPI		
Angland, Margaret	South Miss. Charity Hospital	Laurel
Bramlitt, Mrs. Jamie	Bramlett Hospital	Oxford
Collins, Susie May	c/o Drs. Trudeau and O'Mara	Biloxi
Davies, Willie Lee	741 Gillespie St.	Jackson
Easterling, Emma*	Vicksburg Clinic	Vicksburg
Ellsey, Hettye	11th St. and 21st Ave.	Meridian
Francis, Louise	Clarksdale Hospital	Clarksdale
Hatchett, Harriett S.	Fite Hospital	Columbus
Maddox, Mrs. Marie I.	Miazza Woods Bldg.	Meridian
Mason, Mrs. Irene	Box 108	Greenville
Owen, Mrs. Sam**	George C. Hixon Mem'l Hosp.	Electric Mills
Taylor, Minta H.	No. Miss. Community Hospital	Tupelo
Varnado, Maud E.	Laurel General Hospital	Laurel
Wates, Mrs. Elizabeth N.	3950 Council Circle	Jackson
Young, Effie	Pontotoc Clinic	Pontotoc
MISSOURI		
Anderson, Marion L.	Barnes Hospital	St. Louis
Breitweiser, Ineze	1755 So. Grand	St. Louis
Buenger, Viola M.	206 Washington St.	St. Charles
Charles, Mrs. Sylvia Cole*	368 N. Taylor	St. Louis
Cox, Anna	Missouri Baptist Hospital	St. Louis
Dickison, Hazel M.	3521 Henrietta St.	St. Louis
Frein, Cecilia	St. John's Hospital	St. Louis
Gay, Reva	5428 Delmar	St. Louis
Gettinger, Anna L.	1621 Grattan	St. Louis
Gettinger, Rose H.	6340a Clayton Road	St. Louis
Glenn, Tommie P.	6129 Hoffman	St. Louis
Grupp, Doris M.	908 Beaumont Medical Bldg.	St. Louis

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Hartmeister, Meta M.	St. Louis County Hospital	St. Louis
Hoffman, Mary L.	St. Louis County Hospital	Clayton
Huff, Mrs. Verda Kemp	16 N. Monroe St.	Carrollton
Koehler, Emma M.	Robert Koch Hospital	Koch
Lamb, Helen	Barnes Hospital	St. Louis
Lindsey, Jessie	4468 Forest Park Blvd.	St. Louis
Marcum, Edith**	216 S. Kingshighway	St. Louis
Miller, Ella M.	Station Hospital	Jefferson Barracks
Newman, Mrs. Beatrice M.	5 Lindworth Place	Ladue Village, St. Louis County
Sister M. Clementia***	St. Anthony's Hospital	St. Louis
Sister Theresa Kettelhut	6150 Oakland	St. Louis
Sieg, Hattie C.	De Paul Hospital	St. Louis
Slasor, Zelle	1400 Professional Bldg.	Kansas City
Spleth, Frieda W.	Missouri Baptist Hospital	St. Louis
Thayer, Ruth A.	1621 Grattan	St. Louis

MONTANA

Christianson, Augusta V.	Montana Deaconess Hospital	Great Falls
Diefenbaugh, Lela M.	Kennedy Deaconess Hospital	Havre
Eliasson, Hilda	Columbus Hospital	Great Falls
Graham, Helen C.	Thornton Hospital	Missoula
Hall, Annie J.	Deaconess Hospital	Great Falls
La Rocque, Dorothy	St. Vincent Hospital	Billings
Rausch, Sara		Fort Peck
Sister Mary Charles	Holy Rosary Hospital	Miles City
Sister Eugene de Tivoli	St. Patrick Hospital	Missoula
Sister Mary Fanahan	Holy Rosary Hospital	Miles City
Sister Mary Helen	Columbus Hospital	Great Falls
Sister Mary Irene	Columbus Hospital	Great Falls
Sister Rachel Rausch	St. John's Hospital	Helena
Sister M. Richard	Holy Rosary Hospital	Miles City
Sister Mary Theophana	St. Joseph Hospital	Lewiston
Sister Victor	St. Patrick Hospital	Missoula
Sister Mary William	Holy Rosary Hospital	Miles City
Winter, Mrs. Olive E.	401 S. Lake Ave.	Miles City

NEBRASKA

Ackerman, Edith	Holdrege Hospital	Holdrege
Anderson, Marie S.	Immanuel Deaconess Hospital	Omaha
Bennett, Dolly M.	Bryan Mem'l Hospital	Lincoln
Bredenberg, Dorothy O.	St. Joseph's Hospital	Omaha
Brich, Marcella R.	St. Catherine Hospital	Omaha
Brogan, Ellen	St. Elizabeth's Hospital	Lincoln
Bulin, Ada		Scottsbluff
Dorsey, Josephine J.	Nicholas Senn Hospital	Omaha
Dugan, Elizabeth I.	St. Joseph's Hospital	Omaha
Ganzel, Charlotte A.	Nicholas Senn Hospital	Omaha
Gulotta, Mrs. Wilhelmina	Lincoln General Hospital	Lincoln
Hain, Agnes G.**	Bishop Clarkson Mem'l Hospital	Omaha
Johnson, Hazelle	St. Joseph Hospital	Omaha
Miller, Lillian***	Roche Hospital	Sidney
Nelson, Leona K.	Methodist Episcopal Hospital	Omaha
Omig, Ruth E.	3452 Larimore Ave.	Omaha
Owens, Mrs. Mabel R.	Immanuel Deaconess Hospital	Omaha
Peterson, Edith L.	Evangelical Covenant Hospital	Omaha
Rice, Irene B.	Odell General Hospital	Odell

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Sister M. Cresentia	St. Elizabeth Hospital	Lincoln
Sister M. Kevin Corcoran	St. Catherine's Hospital	Omaha
Sister M. Scholastica	St. James' Orphanage	Omaha
Sister M. Therese Bannon	St. Catherine Hospital	Omaha
Sister Mary Ursula Dixon	St. Mary's Hospital	Nebraska City
Schollman, Mrs.AmandaM.	Evangelical Covenant Hospital	Omaha
Shaffer, Anna May	Nebraska M. E. Hospital	Omaha
Svoboda, Kathryn C.	Nicholas Senn Hospital	Omaha
Waller, Grace P.	West Nebraska Hospital	Scottsbluff
Woodgate, Mrs. Marie E.	109 West 7th St.	North Platte
NEW HAMPSHIRE		
Pedersen, Carin H.	New Hampshire Mem'l Hospital	Concord
Thompson, Vera L.	Margaret Pillsbury Hospital	Concord
NEW JERSEY		
Aberg, Harriet L.	Muhlenberg Hospital	Plainfield
Bowles, Nancy M.	Hospital of St. Barnabas	Newark
Bryant, Laura	Cooper Hospital	Camden
Carruthers, Aletha H.***	Bayonne Hospital	Bayonne
Cook, Maude M.	Presbyterian Hospital	Newark
Cummings, Marion	Franklin Hospital	Franklin
Dangler, Jessie M.	The Dr. E. C. Hazard Hospital	Long Branch
Dangler, Leona	The Dr. E. C. Hazard Hospital	Long Branch
de Felice, Josephine	Beth Israel Hospital	Newark
Dutton, Philomena	St. Peter Hospital	New Brunswick
Farmer, Mrs. Elizabeth Howard***	7 Blake Ave.	Cranford
Furlong, Rose L.	Elizabeth Gen'l Hospital	Elizabeth
Gaumer,Mrs.Miriam Smith	422 First St.	Lakewood
Gilmore, Phyllis	Presbyterian Hospital	Newark
Hawk, Eleanor R.	Newark Mem'l Hospital	Newark
Hill, Nathalie	Middlesex Hospital	New Brunswick
Holcombe, Mrs. Emily M.	780 Broadway	Newark
Horne, M. Catherine	929 Revere Ave.	Trenton
Keller, Hazel C.	301 Broad St.	Newark
Logan, Della	Cooper Hospital	Camden
Loyd, Belle	Overlook Hospital	Summit
McGarry, Helen M.	Morristown Mem'l Hospital	Morristown
Maunsell, Wilma	Beth Israel Hospital	Newark
Nash, Mrs. Ruth	Muhlenberg Hospital	Plainfield
Patterson, Mary A.	Cooper Hospital	Camden
Patterson, Pearl C.	The Dr. E. C. Hazard Hospital	Long Branch
Reynolds, Harriet E.	Memorial Hospital	Morristown
Sister M.Benildis Schumm	St. Francis American Hospital	Trenton
Shoemaker, Susan B.	St. James Hospital	Newark
Stone, Mae	Presbyterian Hospital	Newark
Strandberg, Mrs. Agnes P.	94 Washington Ave.	Carteret
Sutton, Alberta	Box 86	Lake Hopatcong
Thompson, Ora E.	Elizabeth General Hospital	Elizabeth
Weaver, Gertrude M.	Princeton Hospital	Princeton
NEW MEXICO		
McIntosh, Blanche	Carrie Tingley Hospital	Hot Springs
NEW YORK		
Aalrud, Mrs. Astrid	420 E. 59th St.	New York

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Agnew, Molly M.	149 Humber Ave.	Buffalo
Allen, Jeanette	57 St. Paul's Place	Brooklyn
Andrews, Mabel	Queen's Hospital	Jamaica
Arent, Madeleine	500 Riverside Drive	New York
Armstrong, Anna E.	Memorial Hospital	New York
Armstrong, Ethel	Cumberland Hospital	Brooklyn
Barry, Margaret	St. Mary's Hospital	Rochester
Beal, Mrs. Edna N.	U. S. Marine Hospital	Stapelton, Staten Isl.
Bean, Verna E.	St. John's Hospital	Brooklyn
Bentz, Rosemary F.	Brooklyn Hospital	Brooklyn
Bieber, Clara G.	Woman's Hospital	New York
Bollmeyer, Hancie M.	Wyckoff Heights Hospital	Brooklyn
Blade, Caroline E.	Brooklyn Hospital	Brooklyn
Blanchard, Hazel*	1910 Seventh Ave.	Troy
Botsford, Ruth	Strong Mem'l Hospital	Rochester
Bottrell, Gladys	Memorial Hospital	Catskill
Burger, E. Dorothy	Skidmore College	Saratoga Springs
Calder, Dorothy N.**	Yonkers General Hospital	Yonkers
Carlson, Mabel A.	St. Mary's Hospital	Brooklyn
Chisholm, Winnifred S.	Israel Zion Hospital	Brooklyn
Clode, Mrs. Mary	161 Emerson Place	Brooklyn
Clough, Dorothy	Post-Graduate Hospital	New York
Colleran, Emma A.	Ellis Hospital	Schenectady
Collins, Agnes G.	1320 York Ave.	New York
Cook, Kate	120 Deerfield Ave.	Buffalo
Cook, Mildred	Coney Island Hospital	Brooklyn
Craven, Helen K. (Life Member)	City Hospital	Welfare Island, New York City
Danzeisen, Mrs. Estelle Williams	Midtown Hospital	New York
de Graaf, Hermine	Long Island College Hospital	Brooklyn
de Noyelles, Mrs. Mae H.	St. John's Riverside Hospital	Yonkers
Desmond, Mary	North Country Community Hosp.	Glen Cove, L. I.
De Young, Estella	c/o Miss B. Parker, 130 Ocean Avenue	Brooklyn
Dickson, Eva M.	Brooklyn Hospital	Brooklyn
Dobbie, Marie P.	63 North Hampton St.	Buffalo
Dolce, Mildred R.	496 Swan St.	Buffalo
Donaher, May G.	1845 Becker St.	Schenectady
Doty, Louise V.	287 East 38th St.	Brooklyn
Dougan, Janet B.	Misericordia Hospital	New York
Dougherty, Donna B.	Wilson Mem'l Hospital	Johnson City
Dunst, Elizabeth	177 — 17th St.	Brooklyn
Edwards, Mrs. Karl Bruce	1240 Pacific St.	Brooklyn
Eveleth, Grayce S.	337 E. 30th St.	New York
Fink, Mrs. Louise Merkle	311 E. 72nd St.	New York
FitzGerald, Sarah L.	31 Normandy Ave.	Rochester
Flanagan, Mrs. Helen G.***	Chenango Mem'l Hospital	Norwich
Fowler, Mrs. Sophie C.	400 Clinton Ave.	Brooklyn
Foy, Cora Lee	Manhattan Eye, Ear & Throat Hospital	New York
Franke, Elsa E.	1484 Glenwood Blvd.	Schenectady
Gallon, Martha	Coney Island Hospital	Brooklyn
Gardner, Reba H.	5 E. 98th St.	New York
Geiss, Mrs. Helen M.	Strong Memorial Hospital	Rochester
Glenn, Martha K.	143 E. 53rd St.	New York

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Graham, Ada M.	141 W. 109th St.	New York
Haubennestel, Mrs. Ruth	Vassar Bros. Hospital	Poughkeepsie
Healy, Mrs. Faith	116 West 197th St., Bronx	New York
Hedling, Freida K.	Beth-El Hospital	Brooklyn
Heinz, Martha C.***	588 Bainbridge St.	Brooklyn
Hendrickson, Grace L.	Meadowbrook Hospital	Hempstead, L. I.
Henneberger, Martha M.	Woman's Hospital	New York
Hess, Mrs. Frances	Long Island College Hospital	Brooklyn
Hoge, Esther H.	700 W. 168th St.	New York
Hughes, Grace G.	Woman's Hospital	New York
Jennings, Gertrude M.	New Rochelle Hospital	New Rochelle
Johnston, Maude	246 Ovington Ave.	Brooklyn
Kane, Ethel M.	Strong Mem'l Hospital	Rochester
Keith, Grace M.	622 W. 168th St.	New York
Keller, Bessie M.	Cumberland Hospital	Brooklyn
Kelly, Ida B.	704 — 8th St.	Niagara Falls
Kendall, Mildred M.	Strong Mem'l Hospital	Rochester
Kent, Bernice	148 E. 32nd St.	Brooklyn
Korenik, Boldiena A.	Jamaica Hospital	Richmond Hill, L. I.
Krieger, Mrs. Bessie L.	103 Hooker Ave.	Poughkeepsie
Kuhn, Charlotte	Crown Heights Hospital	Brooklyn
Lambert, Marcella F.	Kings County Hospital	Brooklyn
Lang, Veronica E.	St. Catherine's Hospital	Brooklyn
Lemke, Anna C.	Woman's Hospital	New York
Lewis, Mrs. Elizabeth	Alice Hyde Hospital	Malone
Lindberg, Gladys L.	Staten Island Hospital	Staten Island
Litzen, Catherine	1320 York Ave.	New York
Lipinski, Bernice	Strong Mem'l Hospital	Rochester
Lynch, Eunice	41-08 Parsons Blvd.	Flushing, L. I.
McCoy, Mrs. Charlotte	1320 York Ave.	New York
McFadden, Dessie	1320 York Ave.	New York
MacIver, Kathryn M.	Bay Ridge Sanitarium	Brooklyn
McKay, Cora	Albany Hospital	Albany
McMullen, Julia	Ellis Hospital	Schenectady
MacQuarrie, Barbara	New York Hospital	New York
McQuilton, Ida Mae	Nassau Hospital	Mineola, L. I.
Maisnik, Shirley	125 Bay, 38th St.	Brooklyn
Masler, Catherine A.	105 Carlton Ave.	Brooklyn
Mavor, Mary E.	New York Orthopedic Hospital	New York
Meek, Mary A.	1255 Delaware Ave.	Buffalo
Morrow, Dorothy H.	Highland Hospital	Rochester
Moss, Naomi S.	248 Main St.	Hempstead, L. I.
Mulcox, Mildred G.	24-44 28th St.	Astoria, L. I.
Mullin, Sara R.	New York Hospital	New York
Murphy, Anna D.	Ellis Hospital	Schenectady
Myers, Esther	Whittier Hall, 1230 Amsterdam Avenue	New York
Newsome, Mary E.	Jewish Hospital	Brooklyn
Norris, Anna V.	United Hospital	Port Chester
O'Neill, Anna T.	4810 Tenth Ave.	Brooklyn
O'Neil, Mrs. Veronica T.		Altona
Patten, Helen L.	62 Chestnut St.	Cohoes
Penland, Anne	Presbyterian Hospital	New York
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Prentice, Mildred V.	Bethany Deaconess Hospital	Brooklyn
Rabinowitz, Frances	Staten Island Hospital	Tompkinsville Staten Island
Racette, Alice M.	Ellis Hospital	Schenectady
Rees, Madge	Ellis Hospital	Schenectady
Reusch, Edith M.	Reconstruction Unit, 395 Central Park West	New York
Rice, Lillian A.	39 Palmer Ave., Box 216	Bronxville
Richards, Mrs. Martha	8101 Seventh Ave.	Brooklyn
Riebhoff, Grace H.	Freeport Hospital	Freeport, L. I.
Roach, Evelyn	1320 York Ave.	New York
Roberge, Jeanne	Cumberland Hospital	Brooklyn
Rupert, Cecile B.	Mather Mem'l Hospital	Port Jefferson
Russell, Jessie G.	New York Hospital	New York
Russell, M. Mabel	Potsdam Hospital	Potsdam
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Sister M. Nazarene	Mary Immaculate Hospital	Jamaica, L. I.
Sister St. Ann	St. Joseph's Hospital	Elmira
Satterlee, Charlotte D.	Memorial Hospital	Albany
Schmid, Carol	880 Lafayette Ave.	Buffalo
Schoch, Icie A.	North Country Commun'y Hosp.	Glen Cove
Secrest, Clara M.	Homer Folks Hospital	Oneonta
Shellenberger, Frances V.	196 Washington Park	Brooklyn
Shoemaker, Jane E.	Jewish Hospital	Brooklyn
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Spongberg, Alice J.	Bayridge Sanitarium	Brooklyn
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Stewart, Anne E.	Manhattan Eye, Ear and Throat Hospital	New York
Suhrhoff, Marion A.	Midwood Sanitarium	Brooklyn
Sutliff, Dorothy S.	Mary Imogene Bassett Hospital	Cooperstown
Tippit, Clyde D.	200 W. 16th St.	New York
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von Bockum-Dolffs, Irmgard	Hosp. for Ruptured & Crippled	New York
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Walsh, Blanche L.	Israel Zion Hospital	Brooklyn
Ward, Gladys	759 President St.	Brooklyn
Wark, Marion K.	22 Junius St.	Brooklyn
Weaver, R. Edith	Hudson City Hospital	Hudson
Weisensee, Barbara	Minor Surgical Nursing Service	Hempstead, L. I.
Whitman, Georgia	120 W. 45th St.	New York
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Wurtz, Clara A.	200 Wallace Ave.	Buffalo

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Derrick, Ora	James Walker Mem'l Hospital	Wilmington
Dowd, Nova J.	Rex Hospital	Raleigh
Fleming, Maude M.	Box 327	Louisburg
Goodman, Eliza D.	Duke University Hospital	Durham
Grubb, Mary A.	Cabarrus County Hospital	Concord
Henley, Jamie	N. C. O. Hospital	Gastonia
Knight, Mrs. Edna	Rex Hospital	Raleigh
Luther, Nell	Cabarrus County Hospital	Concord
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Muller, Mary H.	Duke University Hospital	Durham
Paul, Mrs. Katie Grace	206 E. Second St.	Washington
Salmon, Carrie I.	Park View Hospital	Rocky Mount
Scarborough, Mante	Presbyterian Hospital	Charlotte
Sellars, Bessie L.	416 Front St.	Burlington
Snively, Mary H.	Duke University Hospital	Durham
NORTH DAKOTA		
Ammentorp, Magna	Deaconess Hospital	Grand Forks
Hallberg, Caroline B.	Mandan Deaconess Hospital	Mandan
La Valla, Margaret	Quain & Ramstad Clinic	Bismarck
Loosen, Josephine D.	St. John's Hospital	Fargo
Lyngstad, Charlotte	Quain & Ramstad Clinic	Bismarck
Mirick, Grace	517 — 8th St.	Wahpeton
Mattson, Sophia H.	St. Michael's Hospital	Grand Forks
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Sister M. Brendan Tuohy	Mercy Hospital	Devils Lake
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Sister M.Dosithea Swoboda	Trinity Hospital	Jamestown
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Sister M. Rita Hughes	Mercy Hospital	Devils Lake
Sister St. Elizabeth Heyn	St. Michael's Hospital	Grand Forks
Sister M. Veronica	Mercy Hospital	Valley City
Sister Mary William	St. Joseph's Hospital	Minot
OHIO		
Adams, Lou E.	Cleveland Clinic Hospital	Cleveland
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Auble, Mada C.	1613 Home Sav. & Loan Bldg.	Youngstown
Barnett, Florence M.	Glenville Hospital	Cleveland
Barth, Alice L.*	Youngstown, Hosp., N. S. Unit	Youngstown
Bartholomew, Helen G.	Lutheran Hospital	Cleveland
Beros, Anna E.***	St. Joseph's R. C. Rectory	Toronto
Boswell, Mrs. Florence H.	1334 Inglewood Drive	Cleveland
Boyer, Elizabeth	Glenville Hospital	Cleveland
Bruchnechter, Margaret	University Hospitals	Cleveland
Burlage, Mrs. Katherine G.	660 Johnson Ave.	Bedford
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Coughlin, Johanna M.	Good Samaritan Hospital	Dayton
Crauder, Dona	107 Stockton Ave.	Dayton
Dickerson, Mrs. Ann Nightengale**	1601 Mars Avenue, Lakewood	Cleveland
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Fichner, Mrs. Margaret Lupher***	148 N. Main St.	Utica
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Graff, Ruth	University Hospitals	Cleveland
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Kaiser, Emilie	University Hospital	Columbus
King, Mabel E.	Bethesda Hospital	Cincinnati
Kocklauner, Frances	University Hospitals	Cleveland
Lemke, Evelyn	Christ Hospital	Cincinnati
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McGilliard, Dorothy	223 N. Cooper Ave.	Lockland
Macha, Florence	University Hospitals	Cleveland
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Maxwell, Mrs. Leona Thielbar	City Hospital	Akron
Momeyer, Myrn E.	St. Luke's Hospital	Cleveland
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Moore, Rae E.	Akron City Hospital	Akron
Morgan, Martha A.	St. Ann's Hospital	Cleveland
Ormseth, Palma M.	Elyria Mem'l Hospital	Elyria
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Pfeifer, Christine K.	Children's Hospital	Columbus
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Richards, Lucy E.	City Hospital	Cleveland
Riefel, Helen G.	Fairview Park Hospital	Cleveland
Ring, Margaret A.		
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Stanton, Juliet E.	City Hospital	Cleveland
Stillman, Mrs. Irene McFadden	7618 Dorothy Ave.	Cleveland
Sutton, Bessie	City Hospital	Cleveland
Sweet, Marjorie H.	Lutheran Hospital	Cleveland
Thompson, Elizabeth M.	Cleveland Clinic Hospital	Cleveland
Tice, Pauline	Good Samaritan Hospital	Cincinnati
Van Arsdale, Mrs. Myra Anton	St. Luke's Hospital	Cleveland
Walker, Marjory H.	Mt. Sinai Hospital	Cleveland
Walters, Martha	Mt. Sinai Hospital	Cleveland
Ware, Mrs. Mary A. (Life Member)	Children's Hospital	Cincinnati
Wass, Agnes A.	Woman's Hospital	Cleveland
Webb, Alma	Cincinnati General Hospital	Cincinnati
Wertz, E. Ruth	Evangelical Deaconess Hospital	Cleveland
Whyte, Evalyn M.	University Hospitals	Cleveland
Wilkes, Vernie M.	White Cross Hospital	Columbus
Willey, Mary J.	Mt. Carmel Hospital	Columbus

OKLAHOMA

Ball, Audra I.	U. S. Indian Service	Pawnee
Diefenderfer, Dixie Lee	Wesley Hospital	Oklahoma City
Dudley, Annie R.	Wewoka Hospital	Wewoka
Egan, Pierina G.*	Wewoka Hospital	Wewoka
Gandy, Hellon	Wesley Hospital	Oklahoma City
Loftus, Julia D.**	Community Hospital	Elk City
Parks, Mrs. Eula McNiel	926 S. 6th St.	McAlister
Pitt, Mrs. Beatrice W.	300 N. W. 12th St.	Oklahoma City
Puett, Martha	Masonic Hospital	Cushing
Shockites, Helen A.	Indian Hospital	Claremore
Williams, Mrs. Bernice Olson	1428 W. Cedar St.	Durant

OREGON

Amort, Alvine	1312 Mill St.	Eugene
Brown, Avis M.	Columbia Hospital	Astoria
Bunch, Josephine B.	4630 S. W. Front	Portland
Butler, Hazel	2166 N.W. Irving St.	Portland
Byford, Jeannette	Good Samaritan Hospital	Portland
Caraway, Olga L.***	R. 6, Box 772½	Portland
Collinge, Bessie E.	Eugene Hospital	Eugene
Darby, Merwyn	811 — N. W. 20th Ave.	Portland
Davis, Mary E.		Cove
Dempsey, Anne	2062 N. W. Marshall St.	Portland
Dimig, Mary K.	2800 N. Commercial Ave.	Portland
Doerr, Aimee L.	Multnomah Hospital	Portland
Dow, Mrs. Jean E.	2475 N. W. Westover Road	Portland
Downing, Ruth	115 River St.	Newberg
Durno, Mrs. Evelyne B.	1913 Hillcrest Road	Medford
Fagan, Jeanne Claire	St. Vincent Hospital	Portland
Feser, Anne**	Medical Dental Surgery	Portland
Fife, Marie	Room 28, O'Kane Bldg.	Bend

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Floren, Marie E.	Emanuel Hospital	Portland
Gammon, Mrs. Edna C.	301 U. S. Nat'l Bank Bldg.	The Dalles
Giddings, Margret	607 Medical Arts Bldg.	Portland
Harris, Louise	6325 S. E. Morrison St.	Portland
Haug, Emma	2800 N. Commercial Ave.	Portland
Herin, Muriel	Emanuel Hospital	Portland
Hockett, Mrs. Faye Walker	Good Samaritan Hospital	Portland
Johnson, Elizabeth D.	2005 — 28th St.	Milwaukie
Laird, Rosena	65 West 25th	Eugene
Love, Mrs. Margaret H.	3130 N. E. 19th St.	Portland
McCorkle, Mrs. Clara	Hood River Hospital	Hood River
McDonald, Lillian May	Salem General Hospital	Salem
McElligott, Mabel*	4705 N. E. Mallory Ave.	Portland
McGee, Agnes	2328 N. W. Everett St.	Portland
Maher, Bernice	Sacred Heart Hospital	Eugene
Markworth, Marjorie R.	St. Vincent Hospital	Portland
Morse, Cecile L.	Mid-Columbia Hospital	The Dalles
O'Brien, Mrs. Daisy***	Holmes Lane	Oregon City
Paulson, Ida C.	Oregon City Hospital	Oregon City
Pobochenko, Ruth, Mrs.	5714 S. E. Belmont	Portland
Sister Agnes de Boheme	St. Vincent's Hospital	Portland
Sister Mary Angela	Sacred Heart Hospital	Eugene
Sister Ottilia	St. Mary's Hospital	Astoria
Sister Mary Vincent	St. Vincent Hospital	Portland
Shaw, Blossom Cragg	Corvallis General Hospital	Corvallis
Spinning, Marian F.	St. Vincent Hospital	Portland
Vermullen, Angela	2475 N. W. Westover Road	Portland
Wilhelm, Hazel Isakson, Mrs.***	3424 N. E. Tillamook St.	Portland
Williams, Mary D.	2475 N. W. Westover Road	Portland
Wilmot, Katurah M.	2026 S. E. Elliott Ave.	Portland

PENNSYLVANIA

Abary, Edith E.	Harrisburg Hospital	Harrisburg
Allburger, Mrs. Frances M.	107 Tenth St.	Honesdale
Anderson, Maude	Elk Co. General Hospital	Ridgway
Arnold, Dorothy	Indiana Mem'l Hospital	Indiana
Baker, Alma G.	Brookville Hospital	Brookville
Barclay, Mary H.	Uniontown Hospital	Uniontown
Barie, Elfreda	St. John's Hospital	Pittsburgh
Barratt, May E.	Hahnemann Hospital	Scranton
Bartruff, Sara C.	Beaver Valley Gen'l Hospital	New Brighton
Beausoleil, Anne	St. Joseph's Hospital	Lancaster
Beringer, Mary L.	Rochester Gen'l Hospital	Rochester
Bettinger, Agnes E.	St. Joseph's Hospital	Reading
Bingel, Esther A.	St. Luke's Hospital	Bethlehem
Blum, Mildred M.	Altoona Hospital	Altoona
Borgstrom, Hilma C.	Stetson Hospital	Philadelphia
Bowkley, Naomi E.	Wyoming Val'y HomeopathicHos.	Wilkes-Barre
Brady, Sara I.	St. Joseph's Hospital	Pittsburgh
Briggs, Marion L., Mrs.	309 Mattison Ave.	Ambler
Brislin, Ann	Mercy Hospital	Wilkes-Barre
Breslin, Mae C.	Osteopathic Hospital	Philadelphia
Brubaker, Marion E.	Conemaugh Valley Mem'l Hosp.	Johnstown
Bucher, Sara K.	610 W. Lemon St.	Lancaster
Burkett, Cleo P.	954 Bedford St.	Johnstown

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Carpenter, Lena	1015 Wyoming Ave.	Exeter
Chapman, Mrs. Mildred K.	1903 Green St.	Philadelphia
Charlton, Mrs. Ethel G.	Coatesville Hospital	Coatesville
Cleaver, Kathryn E.	Mercy Hospital	Wilkes-Barre
Coane, Marcelen P.	University of Penna. Hospital	Philadelphia
Connolly, Pearl E.	1542 Easton Ave.	Bethlehem
Cool, Mary E.	West Penn Hospital	Pittsburgh
Crawley, Stella M.	637 Indiana Ave.	Glassport
Davies, Marian	Moses Taylor Hospital	Scranton
Davis, Edith	Allentown Hospital	Allentown
Davis, Elizabeth F.	South Side Hospital	Pittsburgh
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Degutis, Margaret M.	Pottsville State Hospital	Pottsville
Dibert, Helen L.	Memorial Hospital	Monongahela
Dickinson, Mary K.	Mary Drexel Children's Hosp.	Philadelphia
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Donovan, Rose G.*	Mt. Sinai Hospital	Philadelphia
Dougherty, Gertrude	Charleroi-Monesson Hospital	Charleroi
Dougherty, Loretta A.	4614 — 5th Ave.	Pittsburgh
Emerick, Ida McK	Rochester Gen'l Hospital	Rochester
Foote, Belle R.	Robert Packer Hospital	Sayre
Foster, Anne B.	Citizen's Gen'l Hospital	New Kensington
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George, Rebekah W.	Homeopathic Hospital	Pittsburgh
Gibson, Frances	Columbia Hospital	Pittsburgh
Giffen, Margaret M.	Valley Hospital	Sewickley
Gilmore, Ruth S.	Butler Co. Mem'l Hospital	Butler
Glinz, Mary J.	Kensington Hospital for Women	Philadelphia
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Goodell, Mrs. Ruth	921 Helen Ave., Grand View Hts.	Lancaster
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Hartenstein, Jessie M.	4534 Osage Ave.	Philadelphia
Hartshorne, Grace M.	Philipsburg State Hospital	Philipsburg
Hastings, Mildred E.	Graduate Hospital, Univ. of Pa.	Philadelphia
Hendricks, Martha L.	West Side Hospital	Scranton
Hitz, Leta A.	Community Hospital	Kane
Hobek, Margaret A.	Canonsburg Gen'l Hospital	Canonsburg
Houck, Edna I.	Philipsburg State Hospital	Philipsburg
Hough, Loretta A.	Westmoreland Hospital	Greensburg
Hunter, Bessie F.	Mt. Sinai Hospital	Philadelphia
Ingram, Nancy	Philadelphia Gen'l Hospital	Philadelphia
Irons, Edwina M.	Episcopal Hospital	Philadelphia
Jenkins, Anna T.	State Hospital	Ashland
Johnston, Naomi A.	Methodist Episcopal Hospital	Philadelphia
Jones, Agnes M.	32 Harrison St.	Munhall
Jones, Katherine	Magee Hospital	Pittsburgh
Jones, Verona M.	Uniontown Hospital	Uniontown
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King, Madeleine M.	848 Park Ave.	Meadville
Kissell, Esther M.	Harrisburg Hospital	Harrisburg
Knicely, Helena K.	Oil City Gen'l Hospital	Oil City
Knipper, Margaret E.	St. Joseph's Hospital	Philadelphia
Kolker, Bessye R.	Mt. Sinai Hospital	Philadelphia
Kramlich, R. Margaret	3804 Chestnut St.	Philadelphia
Krause, Helen C.	Temple University Hospital	Philadelphia
Kutz, Anna M.***	50 W. Main St.	Glen Lyon
Langan, Kathryn L.	J. C. Blair Mem'l Hospital	Huntingdon
Laurence, Beatrix M.	Bradford Hospital	Bradford
Leidy, Mrs. Albertine R.	51 No. 40th St.	Philadelphia
Lewis, Hazel M.	Graduate Hospital	Philadelphia
Lewis, Rhoda	General Hospital	Wilkes-Barre
Light, Dorothy C.	115 S. Railroad St.	Hummelstown
Ligon, Maurine	126 So. 40th, Apt. 212	Philadelphia
Linden, Christine E.	Pittston State Hospital	Pittston
Lloyd, M. Elizabeth	255 So. 17th St., 25th fl.	Philadelphia
Lockwood, Jennie M.	St. Joseph's Hospital	Philadelphia
Long, Ailene	St. Luke's Hospital	Bethlehem
Lucas, Clara E.	Univ. of Penna. Hospital	Philadelphia
McCormick, Margaret	General Hospital	Wilkes-Barre
MacCullough, Sylvia I.	Jewish Hospital	Philadelphia
McDade, Mary A.	140 W. Long Ave.	DuBois
McFate, Isabel	Nason Hospital	Roaring Spring
McGeary, Mary V.	438 Maple St.	Jenkintown
McKean, Mrs. Bertha P.	Passavant Hospital	Pittsburgh
McKeon, Anna	Bradford Hospital	Bradford
McLaughlin, Lucille C.	Westmoreland Hospital	Greensburg
McTurk, Mrs. Theresa A.	Metropolitan Hospital	Philadelphia
Machusak, Anne	Polyclinic Hospital	Harrisburg
Maguire, Mary A.	107 E. Gorgas Lane	Philadelphia
Maguire, Sarah A.	Franklin Hospital	Franklin
Malloy, Muriel F.	Magee Hospital	Pittsburgh
Margison, Mathilda M.	St. Francis Hospital	Pittsburgh
Marren, Alma D.	St. Joseph Hospital	Lancaster
Masterson, Dorothy A.	St. Agnes Hospital	Philadelphia
Mayer, Amelia	Homeopathic Hospital	Pittsburgh
Meszaros, Rose	R. F. D. 1, Box 122	Riegelsville
Millard, Elizabeth J.	General Hospital	Lancaster
Miller, Anna J.	5506 Fifth Ave.	Pittsburgh
Miller, Emma A.	Geisinger Mem'l Hospital	Danville
Miller, Mary E.	York Hospital	York
Miller, Zella C.	Jameson Mem'l Hospital	New Castle
Minnick, Hilda I.	Columbia Hospital	Pittsburgh
Morrison, Jessie	Chester Hospital	Chester
Morrison, Maria M.	West Penn Hospital	Pittsburgh
Myers, Margaret	Williamsport Hospital	Williamsport
Nelson, Thelma	Geisinger Mem'l Hospital	Danville
Noll, Katherine B.	Butler Co. Mem'l Hospital	Butler
Oberholtzer, Irene S.	Pottstown Hospital	Pottstown
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O'Harra, Marian	Centre County Hospital	Bellefonte

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Palmer, Elsie M.	Children's Hospital	Pittsburgh
Payne, Edith D.	University of Penna. Hospital	Philadelphia
Peterson, Esther E.	Chester County Hospital	West Chester
Pflieger, Bregetta F.	Mercy Hospital	Johnstown
Plowman, Katharine A.	Harrisburg Hospital	Harrisburg
Pnellie, Lena M.	Elk County General Hospital	Ridgeway
Ponesmith, Mrs. Sarah S.***	236 Walton St.	Lemoyne
Powell, Dora E.	Taylor Hospital	Ridley Park
Rahn, Margaret R.	723 Wister St.	Philadelphia
Rapp, Elizabeth	Lankenau Hospital	Philadelphia
Rau, Mary M.	Shelby Hospital	Ellwood City
Ray, Mary M.	Andrew Kaul Mem'l Hospital	St. Mary's
Reed, Marion A.	Jewish Hospital	Philadelphia
Reigel, Ruth A.	Frankford Hospital	Philadelphia
Render, Gertrude	Homestead Hospital	Homestead
Richter, Leola M.	Presbyterian Hospital	Pittsburgh
Ritzert, Mildred	Eye and Ear Hospital	Pittsburgh
Roenbaugh, Mary A.	West Penn Hospital	Pittsburgh
Rose, Anna Marie	St. Margaret Mem'l Hospital	Pittsburgh
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Sister Mary Audry Wagner	St. Vincent's Hospital	Erie
Sister Bonosa	Sacred Heart Hospital	Allentown
Sister Mary Grace King	Mercy Hospital	Johnstown
Sister M. Irma Gatens	Mater Misericordia	Merion, Montgomery Co.
Sister Joseph Therese	St. Joseph's Hospital	Pittsburgh
Sister Mary Jude McCall	Roselia Maternity Hospital	Pittsburgh
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Sister M. Ludgeris	Sacred Heart Hospital	Norristown
Sister M. Mercedes	Pittsburgh Hospital	Pittsburgh
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MacLeod, Kathrine G.	Rhode Island Hospital	Providence
Schurman, Myrta J.	South County Hospital	Wakefield

SOUTH CAROLINA

Davies, Eliza H.	Roper Hospital	Charleston
Hinnant, Mary F.	1417 Hampton Ave.	Columbia
Meyer, Annie J.	279 Meeting St.	Charleston
O'Leary, Glena B.	Roper Hospital	Charleston

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Reagan, Genevieve	Sioux Valley Hospital	Sioux Falls
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Sister M. Camillus Shealy	McKennan Hospital	Sioux Falls
Sister Mary Celine	St. Luke's Hospital	Aberdeen
Sister Mary Cornelia	St. Luke's Hospital	Aberdeen
Sister M. Donata Bentele	Sacred Heart Hospital	Yankton
Sister M. Elizabeth Seman	St. John's Hospital	Rapid City
Sister M. Eulalia	St. Joseph's Hospital	Mitchell
Sister M. Irmina	Our Lady of Lourdes Hospital	Hot Springs
Sister M. Laurentia	Our Lady of Lourdes Hospital	Hot Springs
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Sister Mary Matilda	St. Joseph's Hospital	Mitchell
Sister M. Rose McCormick	St. Luke's Hospital	Aberdeen
Skinner, Mrs. Marjory M.	St. Joseph's Hospital	Deadwood

TENNESSEE

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Birkhead. Elna Z.	Baptist Hospital	Memphis
Bowyer, Mrs. E. W.	316 Doctors Bldg.	Nashville
Bryant, Nettie M.	1224 Exchange Bldg.	Memphis
Caldwell, Bessie	Takoma Hospital & Sanitarium	Greeneville
Caldwell, Mazie L.	919 E. McLemore	Memphis
Crabtree, Willie C.	c/o Dr. Geo. C. Williamson	Columbia
Donk, Louise de Vries	Vanderbilt Hospital	Nashville
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Kittrell, Mary A.	1236 Madison	Memphis
Kooyman, Jacqueline C.	John Gaston Hospital	Memphis
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McNiell, Lillie	800 — 19th Ave., South	Nashville
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Mockbee, Mattie C.	2009 Lamar	Memphis
O'Brien, Jean**	869 Madison Ave.	Memphis
Pintar, Anna M.	Baptist Memorial Hospital	Memphis
Rowland, Mary H.	800 Jones St.	Old Hickory
Selby, Georgiana	St. Thomas Hospital	Nashville
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Troster, Mrs. Gertrude Alexander	654 Stonewall Place	Memphis
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Vickers, Hattie	Vanderbilt University Hospital	Nashville
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Wolff, Waverlyn	632 McDavitt St.	Memphis

TEXAS

Anderson, Adelia M.	1302 Main St.	Lubbock
Armstrong, Jessie	Route 2	Corsicana
Beck, Osa	Medical and Surgical Clinic	San Angelo
Brockman, Bessie M.	St. Paul's Hospital	Dallas
Buckner, Mrs. Margaret	St. Joseph Hospital	Fort Worth
Cable, Marcella A.**	Hermann Hospital	Houston
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De Vet, Friedah M.	1411 San Antonio St.	Austin
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Drucke, Cliffie B.	Waxahachie Sanitarium	Waxahachie
Dumas, Frances E.	Graham Hospital	Graham
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Harrist, Margaret E.	1301 Broadway	Lubbock
Headlee, Marie S.	Headlee Hospital	Odessa
Henderson, Golden B.	3012 Carnegie	Houston
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Houle, Eugenie L.	Coffey Clinic	Fort Worth
King, Evelyn K.	Seton Infirmary	Austin
Kirven, Sarah	Torbell Sanitarium	Marlin
Knebel, Viole E.	Crockett Clinic	Crockett
Knight, Sallie F.	Baylor University Hospital	Dallas
Larsen, Sylvia J.	Box 141	Amarillo
Lee, Dorothy	Methodist Hospital	Fort Worth
McBride, Mrs. Thelma	Methodist Hospital	Dallas
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Smith, Gertrude	415 Medical Arts Bldg.	Fort Worth
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UTAH

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Erdahl, Esther M.	Latter Day Saints Hospital	Salt Lake City
Garrison, Mayme C.	L. D. S. Hospital	Salt Lake City
Hood, Gladys	516 N. 1st, West	Salt Lake City
Lemon, Mary	L. D. S. Hospital	Salt Lake City

VERMONT

Northrup, Margaretta M.	Springfield Hospital	Springfield
Richards, Maude E.	Brattleboro Mem'l Hospital	Brattleboro

VIRGINIA

Addleman, Ollie M.	Cabaniss Hall	Richmond
Ailstock, Harriet V.	Parris Mem'l Hospital	Portsmouth
Anderson, Clara V.	Norfolk General Hospital	Norfolk
Burris, Myrtle S.	323 Pembroke Ave.	Norfolk
Burriss, Hattie A.	Kings Daughters Hospital	Portsmouth
Copeland, Vera G.	St. Elizabeth's Hospital	Richmond
Cox, Mrs. Marion A.	212 — 50th St.	Newport News
Dalton, Mrs. Helen O.	Martha Jefferson Hospital	Charlottesville
Doss, Mrs. Julian B.		Penn Hook
Farrell, Agnes M.	St. Luke's Hospital	Richmond
Felgendrager, Rosena J.	Memorial Hospital	Danville
Forgie, Nancy F.	Memorial Hospital	Lynchburg
Godbey, C. Virginia*	Norfolk General Hospital	Norfolk
Hall, Esther H.	N. A. Memorial Hospital	Nassawadox
Hawkinson, Caren	U. S. Naval Hospital	Portsmouth
Lawhorne, Elsie V.	Clinch Valley Clinic	Richlands
Leftwich, Gladys L.	Lewis Gale Hospital	Roanoke
Lewis, Mrs. Lorraine W.	Kings Daughters Hospital	Portsmouth
MacGregor, Elizabeth N.	Alexandria Hospital	Alexandria
Mays, Carrie V.	University of Virginia Hospital	University
Nitsche, Martha E.	Winchester Mem'l Hospital	Winchester
O'Conner, Mrs. Inez E.	Leigh Mem'l Hospital	Norfolk
Payne, Mrs. Minnie F.	University of Virginia Hospital	University
Riner, Essie F.	Shenandoah Hospital	Roanoke
Robinson, Mrs. Lorene L.	Stuart Circle Hospital	Richmond
Rudkin, Margaret F.	Johnstown Mem'l Hospital	Abingdon
Scott, Georgia C.	Lewis-Gale Hospital	Roanoke
Sheppard, Dorothea	Medical College of Va. Hosp.	Richmond
Spencer, Mary B.***	U. S. Marine Hospital	Norfolk
Supinger, Virginia S.	Dixie Hospital	Hampton
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Claude, Alice M.	519 Hutton Bldg.	Spokane
Cudmore, L. Mabel	Deaconess Hospital	Wenatchee
Dorweiler, Margaret	U. S. Marine Hospital	Seattle
Edin, Ruth M.	Providence Hospital	Seattle
Ellstrom, Edith	Swedish Hospital	Seattle
Espe, Ida L.	Swedish Hospital	Seattle
Fisher, Madeline S.	St. Luke's Hospital	Spokane
Gilbert, Lorraine	Mt. Carmel Hospital	Colville
Gill, Edyth M.	P. O. Box 1078	Tacoma
Grunefelder, Emma E.	Hoquiam General Hospital	Hoquiam
Hynson, Gene	4727 Brooklyn Ave.	Seattle
Kester, Mrs. Hilda H.***	329 S. Elm St.	Colville
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Langlow, Mona R.	3832 S. Fawcett St.	Tacoma
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Quirk, Catherine E.	Piedmont Hotel, Apt. 406	Seattle
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Rudkin, Esther	Deaconess Hospital	Spokane
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Sister Frances Thibodeau	St. Ignatius Hospital	Colfax
Sister M. Hercule	Providence Hospital	Seattle
Sr. Joseph of Arimathea Hitu	Providence Hospital	Seattle
Sister Peter of Alcantara	Sacred Heart Hospital	Spokane
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Scully, Elizabeth A.	Deaconess Hospital	Spokane
Sogaard, Gertrude	Children's Hospital	Seattle
Tramm, Mary E.	Deaconess Hospital	Spokane
Trapp, Clara M.	Sacred Heart Hospital	Spokane
Wigen, Ragna P.	Ridpath Hotel	Spokane

WEST VIRGINIA

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Derwae, Lillian I.	General Delivery	Charleston
Evans, Mrs. Evelyn Ebandjieff	Grace Hospital	Welch
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Tierney, Mary A.	St. Mary's Hospital	Clarksburg
Weisman, Mrs. Rose Semer		Parsons

WISCONSIN

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Beckman, Helena M.	St. Mary's Hospital	Superior
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Cunningham, Helen R.	Milwaukee Hospital	Milwaukee
Donovan, Mary	Milwaukee Co. Gen'l Hospital	Milwaukee
Esval, Sigrid	Luther Hospital	Eau Claire
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Kraft, Marie	Methodist Hospital	Madison
Laughlin, Rose	Mt. Sinai Hospital	Milwaukee
Lisignoli, Irma J.	St. Joseph's Hospital Annex	Milwaukee
Maechtle, Ora R.	Deaconess Hospital	Milwaukee
Magnin, Martha M.	1821 W. Wisconsin Ave.	Milwaukee
Mayer, Marguerite E.	Marshfield Clinic	Marshfield
Nelsen, Camilla M.	2858 N. Cramer St.	Milwaukee
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Sister Adolpha Ray	St. Nicholas Hospital	Sheboygan
Sister M. Agatha Gerber	St. Mary's Hospital	Rhinelander
Sister Mary Bernadette	St. Joseph's Hospital Annex	Milwaukee
Sister Johanelle Woityna	St. Vincent's Hospital	Green Bay
Sister M. Mercedes	St. Elizabeth Hospital	Appleton
Sister St. Patricia	St. Mary's Hospital	Green Bay
Sister M. Theonilla Henel	St. Mary's Hospital	Wausau
Sister M. Yvonne Jenn	St. Rose Convent	LaCrosse
Sauer, Olga E.	Milwaukee Hospital	Milwaukee
Schroeder, Norma E.	Milwaukee Hospital	Milwaukee
Sedwick, Gertrude	Shawano Municipal Hospital	Shawano
Smith, Lucille H.	Evangelical Deaconess Hospital	Milwaukee
Sorenson, Julia	Theda Clark Hospital	Neenah
Stranz, Violet L.	St. Joseph's Hospital	Milwaukee
Taylor, Mrs. Viola Moser	2329 N. 34th St.	Milwaukee
Thielen, Leone A.	St. Joseph's Hospital	Milwaukee
Tinker, Emma	1040 N. 15th St.	Milwaukee
Ulbricht, Edna L.	St. Luke's Hospital	Milwaukee
Voller, Elizabeth M.	St. Elizabeth Hospital	Appleton
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Cook, Josephine	St. John's Hospital	Jackson
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HAWAII		
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de Shazo, Laura E.		Pahala
deTenley, Mrs.Alice Berg**	Box 299	Honolulu
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Maxwell, Georgia M.	Queen's Hospital	Honolulu
Morin, Beatrice K.	45 Young Bldg.	Honolulu
Ogelsby, Fannie M.	Kapiolani Hospital	Honolulu
Pfauser, Chrystine H.	Queen's Hospital	Honolulu
Short, Augusta Lee	Station Hospital	Schofield Barracks
Thompson, Edna C.	Hilo Memorial Hospital	Hilo
Fish, Isabelle	Base Hospital	Anchorage, Alaska
Relihan, Mrs. Lerlene Stauffer	Box 1068	Balboa, Canal Zone
Savage, Anne	Gorgas Hospital	Ancon, Canal Zone
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